

INDUSTRIAL-ARTS MAGAZINE

Incorporating: HANDICRAFT and the ARTS AND CRAFTS MAGAZINE

BOARD OF EDITORS

E. J. LAKE,

Head, Department of Art and Design,
University of Illinois, Champaign, Ill.

S. J. VAUGHN,

Head, Department of Manual Arts, Northern
Illinois State Normal School, DeKalb, Ill.

W. H. HENDERSON,

Major, Sanitary Corps,
National Army, Washington, D. C.

WILLIAM C. BRUCE, Managing Editor

Published Monthly by

THE BRUCE PUBLISHING COMPANY, Milwaukee, Wis.

Established 1891

FRANK M. BRUCE, Publisher

E. E. KRILL, Business Manager

H. KASTEN, Subscription Manager

W. J. LAKE, Eastern Advertising Manager



OFFICES:

MILWAUKEE: 129 Michigan St.

New York: 1 Madison Ave.

Chicago: 64 W. Randolph St.

Vol. VII

JUNE, 1918

No. 6

TABLE OF CONTENTS

	PAGE
Taking Stock of American Women as Wage Earners.....	Edna Bryner..... 207
Closer Correlation Between the Fine Arts Department and the Industrial Arts Department.....	Clara Torrey Clement... 210
Educational Efficiency.....	E. E. Sheldon..... 214
Wattless Transformer.....	Edwin F. Judd..... 218
Junior Red Cross Activities in the Indianapolis Elementary Schools.....	Florence H. Fitch..... 222
Junior Red Cross Work in a High School.....	C. E. Partch..... 224
Prevocational Training for Girls as Conducted by the North Bennet Street Industrial School, Boston.....	George C. Greener..... 227
Editorial.....	232
A New Kind of Graduation Program.....	William A. Carter..... 234
Keep Bees and Save Sugar.....	Earl D. Hay..... 235
Problems and Projects:	
A Rural School Project.....	Charles A. King..... 239
A Medicine Cabinet.....	Le Roy A. Prescott..... 240
A Folding Camp Stool.....	Ralph F. Windoes..... 241
Checker Rings.....	Otto K. Wohlers..... 242
A New Application of an Old Idea.....	Charles LaBounty..... 243
A Model Yacht.....	Hilding Froling..... 244
The Eastern Arts Convention at New Haven.....	Frederick W. Ried..... 246
Index for Shop Library.....	C. S. Chapman..... 247
Now, Are There Any Questions?.....	248
News Notes.....	XXI
Program of the Department of Vocational Education and Practical Arts of the N. E. A.....	XXV
New Books and Pamphlets.....	XXVII
The War and the Schools.....	XXXIII
Manufacturers News.....	XXXV
Personal News Notes.....	XXXVI

Entered January 20, 1914, as second-class matter in the Postoffice at Milwaukee, Wis., under the Act of March 3, 1879. Copyright, 1918, by The Bruce Publishing Co. All rights reserved. Title registered as a Trade Mark in the U. S. Patent Office, January 16, 1917. Member of the Associated Business Papers and Audit Bureau of Circulation.

SUBSCRIPTION INFORMATION.

The subscription price of the *Magazine* is \$1.50 per year, payable in advance. Postage for Canadian and Mexican subscriptions, 35 cents; for foreign countries, 50 cents. Single copies, not over six months old, 25 cents; more than six months old, 50 cents. Notice for discontinuance of subscriptions must reach the Publication Office in Milwaukee, at least fifteen days before date of expiration, with full balance due to date. Notices for changes of address should invariably include the old as well as the new form of address. Complaints of non-receipt of subscribers' copies cannot be honored unless made within fifteen days after date of issue.

EDITORIAL CONTRIBUTIONS.

The Board of Editors invites contributions of all kinds bearing upon the Industrial-Arts Education, Manual Training, Art Instruction, Domestic Science, and related subjects. Unless otherwise arranged for, manuscripts, drawings, projects, news articles, etc., should be sent to the Publication Office in Milwaukee, where proper disposition will be made. The Board of Editors meets once or oftener each month in Chicago, and all contributions submitted are given careful attention. Contributions when accepted are paid for at regular space rates. In all cases manuscripts should be accompanied by full return postage.

The Industrial-Arts Magazine is on sale at Brentano's, 5th Ave. and 27th St., New York City; John Wanamaker, Market St., Philadelphia; A. C. McClurg & Co., 218 S. Wabash Ave., Chicago.

The "YANKEE" Ratchet

Multiplies

Man's Power

With Five Adjustments—

1. Plain Drill
2. Left-hand Ratchet
3. Right-hand Ratchet
4. Double Ratchet
5. Gears Locked

—and Two Speeds,

Controlled
at a
Finger
Touch

this "YANKEE" Ratchet Breast Drill is "doing its bit" in saving time and labor. It will make any man or manual training student a better mechanic; enable him to do faster and more efficient work.

He can instantly adapt his "YANKEE" Ratchet Breast (or Hand) Drill to the working conditions of any job. It operates in places where no other drilling tool can be worked. For instance:

In cramped quarters, the "Double Ratchet" keeps drill cutting on both forward and backward movements of crank, no matter how slight. No lost time or motion! Ratchet adjustments, as well as speed changes, are instantly available, at a finger touch, without removing drill from work.

"YANKEE" Ratchet Breast Drill

No. 1555—Length, 17 inches. Three-jaw chuck, for round shank tools up to $\frac{1}{2}$ " diam.

No. 555—Length, $17\frac{1}{2}$ inches. Two-jaw chuck, for holding both rounds and squares.

Price, \$7.70

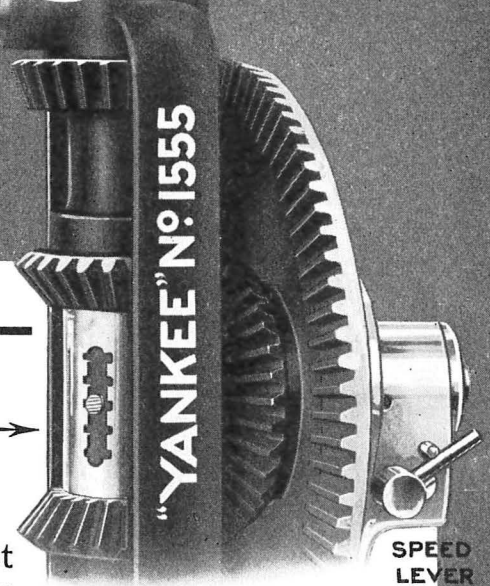
Your dealer can supply you

Write us for "YANKEE" Tool Book," illustrating and describing many highly specialized time- and labor-saving drilling, boring and screw-driving tools. The tools of today!

NORTH BROS. MFG. CO., Philadelphia

"YANKEE"

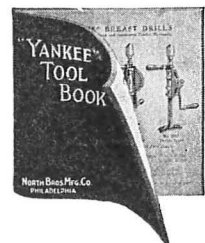
Breast and Hand Drills are made in 14 styles and sizes—ranging from this powerful No. 1555 to the convenient little No. 1530 Hand Drill, but $10\frac{1}{2}$ inches in length, yet has all five ratchet adjustments.



SPEED
LEVER

"YANKEE" TOOLS

Make Better Mechanics



Taking Stock of American Women as Wage Earners

Edna Bryner, New York, N. Y.



WAGE earning women constitute a national resource of peculiar value. Signs of a new evaluation of their capacities in the light of their ready adaptability to various kinds of organized national work may be observed in official publications on their conduct during the war. "It is doubtful whether men, if a similar call had been made on them, could have responded with a greater degree of alacrity," says one recent authoritative British labor report in its traditional safety first manner.

The truth is that the war has been the means of dramatizing many of the qualities of women which men have been unwilling to believe the feminine kind possess, qualities which men think necessary for the performance of suffrage and other manly duties. Women have been practicing these qualities individually and privately ever since there were women. The war and the press have made them collective and public.

Today women are doing men's work. They are also doing their own work a hundred-fold. They have not been changed by the magic of war over night into men. They are merely measuring up to demands thrust upon them and opportunities opened up to them. All kinds of work, traditional and untraditional, from thumb print reading to shell manufacture, they are carrying on in a way which has caused expressions of surprise from employers thruout the various countries.

America has begun the dramatization of her women's abilities. Actually how large a resource of women has she already trained or partially trained in carrying on the multitude of jobs necessary for the maintenance of a country in time of peace and doubly necessary in time of war? Such minimizing phrases as "only a quarter of the women work" and "women work only about seven years on the average" roll from tongue to tongue wherever a wavering argument needs bolstering. Of the actual extent of wage earning among women few persons have any idea except such as is formulated from vague concepts of fleeting percentages. A satisfactory stocktaking is made difficult because of the androcentric fashion of presenting statistics. The national census of workers must be given for women in a way different from that for men if it is to show how large a part wage earning plays in the lives of the women of the country. The material at present available on this subject is of use to show how far from the truth the popular concep-

tion is rather than to define accurately the wage earning situation.

The Changing Army of Women Workers.

The helter-skelter fashion in which women enter and leave the gainful occupations is in great contrast to the orderly precision with which men are mustered into the wage earning ranks early in life to be held enchained until the end. The army of women workers is constantly changing. Every year thousands of young girls secure their working papers at the fulfilment of the minimum age and schooling requirement in their respective states and embark on an indeterminate wage earning career in factories and shops. Every year thousands of young women equipped with a few years of special training enter the middle ranks of industry; and at the same time a considerably smaller number, older in years and more highly trained, swell the upper ranks. Many women of mature years enter gainful occupations for the first time after their marriage to supplement their husband's income, or after they are widowed or divorced to support themselves and their children, or after their children are grown to use idle time to the best advantage.

Women stop working at all ages. The great bulk of them file off, year after year, into the ranks of housekeepers and child rearers and their places are filled by new recruits. Some work all their lives. The wage earning portion of women changes its personnel so tremendously from year to year that the total proportion engaging in this activity must be considerably larger than the proportion shown to be at work at any one time.

Every ten years the number of women wage earners is made known in the United States Census. The number is the result of a count made by census takers who go from door to door thruout the country. The count includes only those women who are working at the time the census is taken. It does not take into account those who went to work after the preceding census but who stopped to engage in household activities before the next one, after working anywhere from one to nearly ten years. It does not take into account those who were working at the time of the preceding census but who stopped before the next one, after working anywhere from one to nearly twenty years. Obviously thousands and thousands of women are wage earners for periods varying from one to ten years and are never listed in any census. Thousands more, counted as wage earners in one

census, cannot be counted in the next, altho they may have worked five, or ten, or fifteen years. The total number of women who work is a matter for wide speculation.

When the census takers made their count in 1910, they found that exactly one-quarter of all the women 16 years of age and over in the United States were wage earners. In this quarter they included only the women who were at work in 1909 when the census takers were going from door to door. They did not count those who entered and left wage earning between the 1900 and the 1910 census. They did not count those who were working at the time the 1900 census was taken but who stopped before the 1910 census takers began to canvass the country. Apparently this one-quarter is a poor index to the extent of wage earning among the women of the United States.

The majority of women wage earners undoubtedly begin to work at some time during those years immediately following the end of the schooling period. The age period corresponding most closely to this time, for which figures are available, is that from 16 to 20 years. According to the census, out of every 100 girls from 16 to 20 years of age in the entire country 40 are at work. The proportion in the cities is much larger. In the eight largest cities from 51 to 66 out of every 100 girls of this age period are at work, the average being about 60.

This proportion, approximating the truth as far as actual figures permit, constitutes a much better index to the total number of women who work than the often quoted one-quarter. However, it is still far from the actual percentage. The figures for this early working period represent only those women who were working at the time the census was taken. They leave out of account those who went to work before 16 or at some time between 16 and 20 years of age but who stopped before the census was taken.

Making allowance for the evident discrepancy in these earlier years and for the large number who go to work after the age of 21, one could certainly place the proportion of women who engage in wage earning at some time or other in their lives at not less than three-quarters. The one-quarter which stands so emphatically in the minds of many persons as the proportion of women who work might much better stand for the proportion who do not work. Those who are reluctant to depart from actual figures will do well to hold in mind that two-fifths of all the young women in the country from 16 to 20 years of age are at work; that three-fifths of all the young women of this age period in the cities are at work; and that these proportions cannot possibly represent the total number of women who avail themselves of the experience of wage earning.

The Minimum Availability of Women for Wage Earning.

The majority of women have wage earning experience. How much experience they have is a mat-

ter of some concern. On the score that their working life is too short to justify expenditure for training them for wage earning, innumerable attempts have been made to discourage the movement for educating girls vocationally. There is a tradition, used again and again with an air of authority in such arguments, that women work seven years on the average. This traditional average, large enough in the writer's estimation to be used as an argument for rather than against training, seems on analysis to be no more than a chance deduction from the hazy observation that girls go to work at 14 and get married at 21. Some orator probably conjured it up in a tense moment when he needed a fact or two to sustain him. Perhaps he hit the truth. At any rate, the statement has passed unchallenged from mouth to mouth until it has become accepted as a fact.

This average, as far as we know, has no figures to support it; and it bears not even a tenuous relation to the somewhat meagre amount of facts concerning the length of time women actually work. How long women work cannot be determined at present; for the mass of data necessary for this purpose is not accessible and is without near prospect of becoming accessible. The matter may be approached, however, from what may be called the inverse point of view. How long women may reasonably be expected to work may be approximated from a study of marriage statistics. A theoretically possible working life may thus be determined.

Only the extreme feminist will probably challenge the statement that women may be considered generally available for wage earning as long as they are unmarried. This does not mean that married women are not or should not be available. It only recognizes that in the present organization of society and industry married women cannot be counted upon to be generally available.

Observation shows and facts attest, indeed, that singleness and wage earning are in practice not mutually inclusive. There are three and a half millions of single women and four millions of wage earning women between the ages of 21 and 45. At least half a million of women of this age period are therefore both wage earners and also married, widowed, or divorced. A comparison of the number of single women and of wage earners 45 years of age and over shows in like manner that at least half a million of these older women are both wage earners and married, widowed, or divorced. Many single women do not work; so that these figures do not define the whole extent of wage earning among married women. At the same time, no proof is needed that the bulk of women workers are and for many years to come will be recruited from among single women. Singleness may truly be said to furnish a reliable index to the minimum availability of women for wage earning.

Those who have the patience to follow thru

the tale of marriage statistics with its undeniable inferences cannot help but gain a definite conception of the approximate availability of American women for wage earning. Suppose we prognosticate, in the light of their age at marriage, the future work possibilities of the girls of this country 14 years old, the age at which the great mass of them leave school. Most girls actually begin to work at some time between the ages of 16 and 20 and the majority stop wage earning on marrying. On these grounds, girls may be considered generally available for wage earning at some time between the ages of 16 and 20 and their availability may be considered terminated at marriage.

Somewhat more than a third of these 14-year-old girls, in fact 38 out of every 100, will marry before the age of 21. Their availability for wage earning is of short duration. Some of them will remain in school up to the time of their marriage. Some will neither remain in school nor work. Many will work for periods varying from a few months to five years. An average of two and a half years of availability for the whole group will probably be accepted as a generous allowance.

Sixty-two out of every 100 of these 14-year-old girls will be unmarried at 21 years of age. These 62 will have been available for wage earning for two and a half years before the age of 21. In addition they will be available for the period of time between 21 and the age at which they marry. Thirty-one of these girls will marry between the ages of 21 and 25; twelve between 25 and 30; and five between the ages of 30 and 35.

A statistical computation by single years on the basis given above shows that the first group of 31 girls will be available for wage earning for an average of five years; the group of twelve will be available for an average of ten years; and the group of five for an average of 14 years. The remaining 14, who are still unmarried at 35, will be available anywhere from 16

to 25 or 30 years or longer. Their average availability will not fall short of 20 years.

The grand average of availability for every 100 of these 14-year-old girls is seven years. Curiously enough this coincides with the traditional average accorded to wage earning women's actual working life. What the difference is between this minimum availability, this theoretically possible working life, and the actual working life we have no way of knowing at present. The probabilities, if we may make any inferences from data which show the length of time women work in certain specified industries, are in favor of a longer actual working life.

An average for the whole group, at its best, is not important, except in its possibilities, perhaps, for furnishing a basis for misleading statements. One can hardly conceive of solving a problem on the basis of an average of data whose extremes are nothing and all, as in this case, where some do not work at all and others work all their lives. What is important is that almost two-thirds of every year's crop of 14-year-old girls are available on the score of the length of time they remain single for an average of five or more years of work and that almost one-third of them are available for an average of ten years or more. Every year over 900,000 girls become 14 years of age. This great mass of potential womanhood can furnish during unmarried years in sum total more than six million years of wage earning.

A timely stocktaking cannot fail to display the possibilities of such a tremendous national resource. More than half and undoubtedly three-quarters of the women of the country already experienced in wage earning! Six million years of potential wage earning ready to begin its transformation into actual labor every year! Here is a resource not only important as a reserve on which the country can fall back in time of need but valueless in its ready adaptability for steadily upbuilding the welfare of the nation.

CHANGE OF ADDRESS

SEND your Summer and Fall addresses promptly to Milwaukee to guarantee the regular delivery of our Magazine during the next six months. The war has added greatly to the burdens of the post office department and we urge your cooperation to assure the regular receipt of every issue. We cannot hold ourselves responsible for the delivery of your papers unless you notify us of your changes of address as soon as possible.

CLOSER CORRELATION BETWEEN THE FINE ARTS DEPARTMENT AND THE INDUSTRIAL ARTS DEPARTMENT

Clara Torrey Clement
(Conclusion)

IV. Lack of Definite Preparation of Teachers.

A survey was made of the curriculums of normal schools from widely scattered states in which the attitude towards education is notably progressive. The object of this research was to learn what stress, in the training of teachers, was laid on the correlation of fine arts with the crafts and industrial arts, and whether any definite preparation for making such correlation was given to the normal students. It was found that there is a tendency to recognize the correlation between the fine arts and the crafts, but no correlation between the department of fine art and the department of industrial arts was mentioned. In the schools of Connecticut, Illinois, Idaho, and in some of the schools of Massachusetts and New York there was no attempt at correlation of any kind. In other schools in Massachusetts, i. e., Bridgewater especially, and in New York, i. e., in the New York State College for Teachers, as well as in the schools of Missouri, Nebraska, Colorado, Michigan, correlation between these departments was suggested.

While these investigations were not carried to any great extent because of the lack of material at hand the results led to the conclusion that the plan of a course of study carrying out the idea of correlation between the fine arts department and the industrial arts department would have a distinct value.

A series of lessons is presented in which the principles usually taught in the first year of high school drawing, designated as elementary design, are applied to concrete problems in basketry. The method of these lessons is based on what DeGarmo calls "the trinity of instruction," (1) the apperception or assimilation of individual notions; (2) the transition from the individual to the general (classes, principles, rules, maxims, etc.); (3) the return from the general notion to new fields of particulars. The aim of this course is to reach the general principles inductively, thru individual apperception and then to apply these generalizations to specific problems in such a way that the universal application of these truths will be spontaneously grasped by the pupil.

It is suggested that these lessons cover a term of twelve weeks with a recitation hour twice a week.

Lesson I.

Aim: To teach the principles of domination and subordination, i. e., that in good design there is one central idea; all else is subordinated to that idea.

Content: Illustrations of dominance of idea and form.

1. Sistine Madonna, Raphael.
2. Coronation of Napoleon, David.
3. Photograph of Parthenon (restored).
4. Photograph of Gothic Cathedral at Rheims.
5. Photograph of Capitol at Washington, D. C.
6. Photograph of Sheraton highboy.
7. Photograph of Indian basket design.

Method: An informal discussion of each illustration guided by questions from the teacher. The points made for each il-

lustration are tabulated on the board at the dictation of the class.

Plan:

A. Preparation:

1. Statement of the purpose of the lesson, i. e., to discover what is the fundamental reason for deciding that a work of art is good.
2. Explanation of method, i. e., by studying and comparing seven examples we can learn why they are good.

B. Presentation:

1. Sistine Madonna:
 - a. Explanation by teacher of whom the figures represent.
 - b. Discussion to bring out:
 1. Mother's love for child.
 2. Reverence of others for mother and child.
 3. Important position of mother and child in the picture.
 4. The less important position of each of the other figures in the picture.

5. The other figures face the Madonna and Child.

Therefore: 6. This picture shows:

1. Central idea of mother's love, carried out by the important position of Madonna and Child.
2. The idea of reverence for Madonna and Child, made less important by the subordinate positions of the other persons in the picture.

2. Coronation of Napoleon:

- a. Brief discussion led by teacher, of the historic meaning of the picture.
- b. Discussion to bring out:
 1. Interest centered on Napoleon as he raises the crown over Josephine's head.
 2. The important group is small, and at the right side of the picture.

3. Prominence is given to this group by (1) the long court trains, (2) the open space around the group, (3) the eyes of nearly all the spectators directed toward this group, (4) spectators so massed that no attention is attached to any individual; the individual characters of the spectators and the splendor of their costumes is noticed only by close study.

Therefore: 4. This picture shows a central idea of the coronation ceremony; all other ideas, such as the characteristics of the spectators, are kept entirely subordinated.

3. Photograph of Parthenon:

- a. Explanation by teacher that in the criticism of anything that is intended for utility, conformity to the requirements of use must be given first consideration.
- b. Discussion to bring out:
 1. Greek worship of many gods.
 2. The fact that temples were intended to shelter the statue of a god, congregations remaining outside.
 3. The dominant idea of protecting the statue is carried out in the shape of the building, especially by the horizontal lines of the long, low roof, slightly raised in the center, supported by the rows of columns.

4. The proportions of the building make one see it first as a whole before the attention is attracted to the beauty of any of the parts.

Therefore: 5. In this temple we have the dominant idea of a house to protect the statue of a goddess. The beauty of details is subordinated to the usefulness and beauty of the building as a whole.

4. Gothic Cathedral at Rheims:

- a. Brief explanation of the place and of the period when this cathedral was built.
- b. Discussion:
 1. Purpose or use of the Gothic cathedral was
 1. Worship of God, symbolized by spires, pointed arches, all leading the eye upward. Compare with the Parthenon.
 2. Accommodation of large congregations, with large floor space and lofty ceiling, allowing sufficient ventilation.

2. Attention is centered on the building as a whole before it is caught by any of the details. Compare with the Parthenon.

Therefore: 3. The dominant idea is a building in which to worship God. As in the Parthenon, the beauty of details is subordinated to the usefulness and beauty of the whole.

5. Capitol at Washington.

a. Discussion:

1. Use—when built.
2. Style like that of the Greek Parthenon.
3. How the building is adapted to use:
 1. Several stories high.

2. Many windows.
4. Main part of building made prominent by:
 1. Central position and size.
 2. Dome.

Therefore: 5. Dominant idea is a building in which to conduct business. The wings are subordinated to the main building.

6. Sheraton highboy.
 - a. Discussion:
 1. Dominant idea of usefulness, i. e., a chest of drawers.
 2. The decorations, i. e., the broken pediment at the top, brass trim on handles, are not elaborate enough to detract from the beauty and simplicity of the whole.
 7. Indian basket design.
 - a. Discussion:
 1. A basket is intended primarily for use, secondarily to be decorative.
 2. The shape is practical for use.
 3. The decoration subordinate to basket as a whole.

C. Conclusion:

Summary of the points made in the discussion of each photograph, from which are induced the principles of domination and subordination, i. e., in all good designs there is one central idea; all else is subordinated to that idea.

In this lesson the foundation principles of all art are taught inductively, by relating new material to what the pupil already knows. Lesson II translates the generalization reached in Lesson I back to concrete facts, i. e., the return from universals to particulars.

Lesson II.

Application of Lesson I.

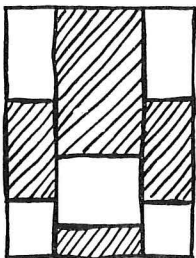
Aim: To apply the principles of domination and subordination to a problem.

Problem: Translate illustrations of Lesson I into oblongs showing the relative proportion of masses.

Content: Material used in Lesson I.

General Plan:

1. After reviewing the points of Lesson I the teacher draws on the board an oblong, translating in it, by means of vertical and horizontal lines, the arrangement of the masses of the Sistine Madonna.



2. Then with suggestions from the pupils, the teacher draws on the board in an oblong the arrangement of the masses of the Capitol.

3. The pupils with brush and ink translate the other illustrations into oblongs showing the arrangement of the masses.

4. Class criticism and discussion of the pupils' work, showing:

1. The proportion of the dominant mass to the subordinate masses.
2. The important position of the dominant mass.

Three class periods are sufficient for Lesson I and its application in Lesson II.

Lesson III.

Further Application of Lesson I.

Problem: To design a pattern for a circular mat, illustrating the principles of domination and subordination. This design is to be carried out in raffia, using the lazy squaw stitch, in the basketry class. Natural colored and one-color raffia may be used.

General Plan:

A. Preparation:

1. Statement of problem.
2. Discussion of principles of domination and subordination.

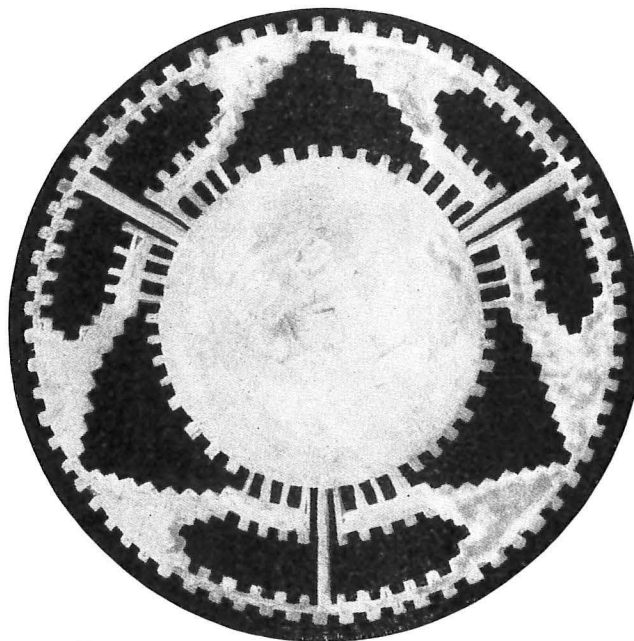
B. Presentation:

1. Discussion of the Indians' way of telling a story in their basket and pottery designs, and the suggestion that each pupil develop a unit which will describe some part of his vacation—for example, a conventionalized canoe, with crossed paddles or fish poles.

2. A circle seven inches in diameter is divided into six equal sectors; the unit is adapted to fit either one or two sectors.

3. Exhibition and class criticism of designs. Points to be noted are:

- a. Can the pattern really be worked out in raffia, using the lazy squaw stitch?
- b. Is there domination and subordination of masses?
- c. Neatness and general appearance of the work.



Lesson III. Design for a Circular Mat.

These preliminary sketches may be drawn on white paper with pencil or charcoal. When the design has been satisfactorily composed, a full-sized drawing, a circle seven inches in diameter, should be made in tempera colors on black or grey paper.

At least four recitation periods should be devoted to this lesson. Lessons I, II, and III form a unit, in which Lesson III emphasizes the principles taught in Lessons I and II by definite application of these principles to a problem to be worked out in the industrial arts department.

Lesson IV.

Aim: To teach that domination and subordination are worked out by laws of:

Rhythm—Which gives motion thru the repetition and joint action of shapes.

Balance—Which gives rest thru the equal attraction of measures.

Harmony—Which gives unity thru a common factor in tones.

Content: Illustrations of Lesson I.

Method: Examination and discussion guided by questions from the teacher. Points tabulated on board.

Plan:

A. Preparation:

1. Statement of the purpose of the lesson, i. e., to discover what elements control the working out of the principles of domination and subordination in these photographs.

B. Presentation:

1. Recognition of rhythm.

a. Discussion of Sistine Madonna.

1. Repetition and joint action of shapes, lines and tones.

2. Certain music makes us want to keep time or dance, gives a sense of motion. The cause is the repetition of measures of sound called rhythm.

Therefore: 3. Repetition and joint action of shapes, etc., in the Sistine Madonna give a sense of movement and rhythm.

b. Discussion of the other photographs calling attention to rhythm.

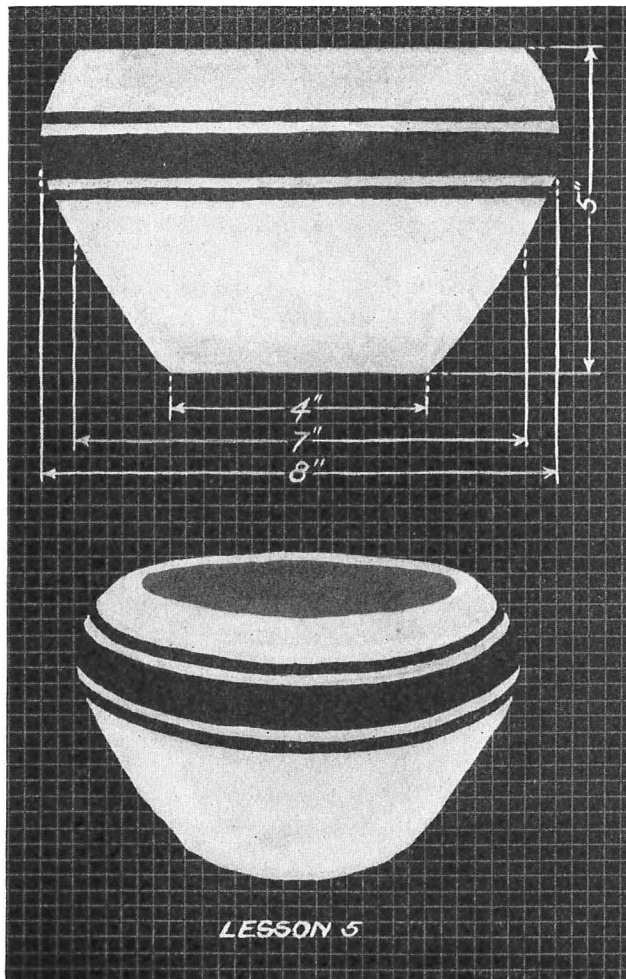
c. Conclusion: Rhythm or motion is given to the sense of seeing by the repetition and joint action of shapes, measures and tones, as it is given to the sense of hearing in music by the repetition of sound.

2. Recognition of Balance.

a. Discussion of the balance or equal attraction between the groups in the coronation of Napoleon. The small group of figures in the open space at the right with their flowing trains balances the large group of closely massed figures exactly as on scales a handful of pebbles can be made to balance a large stone.

b. In the Sistine Madonna small scattered units balance the large central unit.

- c. In the Parthenon the colonnade of slender columns is balanced by the solid rectangular frame of the temple.
- d. Discussion of other photographs showing the balanced relation of parts.
- e. Conclusion, discussion of the feeling of rest which is given by well-balanced parts.
3. Recognition of Harmony.
 - a. Discussion of the common factors in shapes, measures and tones in the photographs.
 - b. Conclusion: Discussion of the unity which is gained thru the use of common factors in shapes, measures and tones.



Lesson V. Design for a Basket.

Summary: Points made in regard to rhythm, balance and harmony which have been reached inductively from a study of the photographs.

Lesson IV is the second step in a natural series presenting progressively the elements of design. Two periods should be devoted to this lesson.

Lesson V.

An Application of the Laws of Design Taught in the First Four Lessons.

Problem: To design a basket using natural raffia and one color with a band pattern. This design is to be worked out in the basketry class.

General Plan:

1. Review of points to be kept in mind,—use, domination, subordination, rhythm, balance and harmony.
2. Consideration of use,—to determine whether the basket is to be a vertical or horizontal mass.
3. Drawing of outline of proposed shape. Points to be considered:
 1. Do vertical divisions show domination and subordination?
 2. Do horizontal divisions show domination and subordination?
 3. Is there subtlety of curve in outline?
4. Refinement of outline.

5. Surface enrichment:

1. Will decoration interfere with use?
2. Will bands of color enhance beauty?
3. How large a space shall the decoration occupy? (Observation of domination and subordination.)
4. Do bands carry out laws of rhythm, balance and harmony?
6. Class criticism of completed designs.
7. Designs drawn to scale and dimensioned on cross-sectioned paper, ready to be worked out in basketry class.

The use of tempera colors on black paper is urged, as the effectiveness, so simply achieved, of this medium, greatly stimulates the interest.

Four lessons will be necessary for the completion of this problem.

Lesson VI.

Further Application of the Principles Taught in the First Four Lessons.

Problem: To design a basket with handles. The decoration for this basket is to be designed in a later lesson.

General Problem:

1. Review points which were observed in Lesson V.
2. Outline of form,—whether the mass is to be vertical or horizontal is determined by the use for which the basket is intended.
3. Outline of mass to show principles of domination and subordination.
4. Refinement of outline; compare with outlines in photographs.
5. Designing the handles. Points to be considered:
 1. Size governed by use.
 2. Do they support the main mass?
 3. Do they repeat the shape of the main mass? (Common factor giving harmony.)
 4. Subordination of handles to main mass.
6. Class criticism of drawings.
7. Drawings made to scale and dimensioned in pencil on cross-sectioned paper.

Two recitation periods should be devoted to this lesson. The decoration of the completed designs must be deferred until instruction in the use of color has been given.

Lesson VII.

Aim: To develop an appreciation of color harmony.

Method: Discussion, led by questions from the teacher, illustrated by blackboard drawing by the teacher.

General Plan:

1. Name the three primary colors.
2. Name the three secondary colors.
3. Arrangement of six colors on a circle divided into six sectors.
4. Colors which lie opposite each other are complementary.
5. Review of the law of harmony (a common factor).
6. Harmony can be formed by a combination of tints and shades of the same hue (monochromatic harmony).
7. Harmony can be formed by the combination of hues which lie next to each other on the color wheel (neighboring or analogous harmony), i. e., yellow and green, which have yellow in common.
8. Color harmony can be gained not only by the use of a common factor but also by contrast, i. e., the combination of complementary colors.

Summary: There are three kinds of color harmony.

Likeness:

1. Monochromatic—Combination of tints and shades of one hue.
2. Analogous—Combination of neighboring colors.
3. Complementary—Combination of opposite colors.

Lesson VIII.

Aim: To teach the ability to recognize degrees of intensity in colors.

Content: Illustrations, i. e., colored plates of Indian pottery and Japanese textiles, specimens of flowers, butterfly wings, and shells.

Method: 1. Examination of illustrations, discussion led by questions from the teacher. Points to be noted:

- a. Intense color is used in small quantity, serves to accent the design.
- b. General use of middle tones or slightly grayed colors.
- c. Effect of the combination of middle colors is restful; reason, law of harmony, gray being a common factor.

2. Demonstration by the teacher to show pupils how middle tones are made: equal parts of two complementary colors are placed on the color wheel; the wheel set in motion shows that the two complements fuse and become gray. Then $\frac{3}{4}$ of one color and $\frac{1}{4}$ of its complement are placed on the color wheel. When the wheel is set in motion the predominating color becomes grayed, a middle tone. The experiment should be repeated until the pupils grasp the significance of middle tones.

Three periods should be devoted to Lesson VII and Lesson VIII.

Lesson IX.

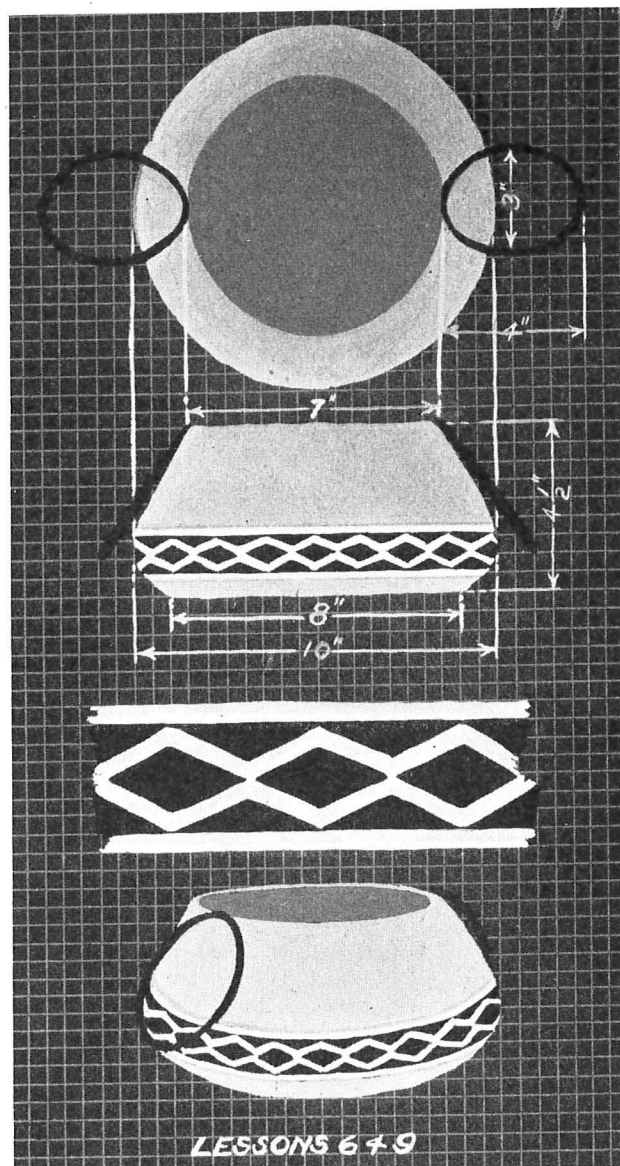
Application of the Principles of Color Taught in Lessons VII and VIII.

Problem: To design a pattern to be applied to the basket shape designed in Lesson VI.

General Plan:

1. Review of design principles, domination, subordination, rhythm, balance and harmony.
2. Design the pattern unit. Points to be considered:
 1. Does it conform to the principles of domination and subordination?
 2. Does it conform to laws of rhythm, and harmony, by repeating some of the forms of the basket?
 3. Do the different elements in the unit balance?
 4. Review of the principles of color harmony.
 5. Application of two complementary colors and either black or white. One of the complements is to be half-intensity, the other very lightly grayed, or nearly full intensity.
 6. Are the principles of design carried out in the application of color?
 7. Emphasis on observing balance in color by keeping the large masses in grayed tones, small spots more intense.
 8. Class criticism of design.
 9. Application of the decorative design to the working drawing of the basket made in Lesson VI. The final plate should be painted in tempera colors on black paper, and should give views showing:
 1. Plan of the basket with dimensions.
 2. Detail of the decoration.
 3. A perspective drawing of the basket.
 10. Class criticism of completed designs.

Six lesson periods must be devoted to making this design. Lessons VII, VIII, and IX form the third unit in this series of lessons, progressing from the (1) statement of the fundamental principles of design in Lesson I, with the application of these principles in Lessons II and III, to (2) the elaboration of these principles in Lesson IV, with the application of a new concept of the first principles in Lessons V and VI, to (3) the enrichment of the understanding of the principles of design by the addition of color principles and their relation to design in Lessons VII and VIII, with the application of this last development of the principles of design in Lesson IX. It is felt that in carrying out in basketry a concrete



Lessons VI and IX. Design for a Basket with Handle.

problem for each stage of the series the student will gain, not only an increased amount of interest and pleasure in the work of his drawing class, but also a perception of the relation which exists, or should exist, between all products of the field of industrial art and the fundamental art principles.

MAN owes his growth, his energy, chiefly to that striving of the will that conflicts with difficulty, which we call effort. Easy, pleasant work does not make robust minds, does not give men a consciousness of their powers, does not train them to endurance, to perseverance, to steady force of will, that force without which all other acquisitions avail nothing.

William Ellery Channing

EDUCATIONAL EFFICIENCY

E. E. Sheldon, Supervisor of Apprentices, The Lakeside Press, Chicago



EFFICIENCY as a term has acquired a new meaning in recent years and is now, in industry, the one word being given the most serious study. Why the magic of the word and the study of efficiency? Is it something new or is it an old subject in new form?

Industry in this country has advanced by leaps and bounds under the influence of apparently unlimited natural resources, until the time has approached, conservative business men fear, when resources may be exhausted by the reckless waste and the great developments of the past be checked. The result is the growth of a system known as an efficiency system or scientific management which is based upon carefully formulated principles. The operation and application of these principles to industry has, and is, making marked changes in the cost of the product, the elimination of waste, the increase in capacity and the rewards to the workers, all these tending to produce more satisfactory conditions in the industries. Definite ideals, reliable, immediate and accurate records, and standards of time, instruction, conditions and operation, with suitable rewards for high efficiency are some of the principles that are producing satisfactory results.

These principles of efficiency, if applied to some of the educational problems, would produce marked changes in the quality and the quantity of the work, and the product of the educational factory would show an increased efficiency commensurate with the time and energy spent in time and motion studies and the application of the principles.

The first principles, definite ideals, has long received much attention and study in the educational field, but without satisfactory results.

In business, a definite ideal is to produce a standard product, one that the commercial world will receive and measure by a certain value in terms of money. Let us measure one of the products of the educational factory, which we will assume to be a boy just past fourteen years of age. He is looking for a job, where or what he knows not. He reads the "want ads," he follows every clue; he finally after days of hunting finds a job that will pay enough to provide car-fare and a lunch and he is ready to become a part of the great industrial world.

He is a bright, active lad, a grammar-school graduate, armed with a working certificate and a diploma, the public's only provision for his industrial career.

He has high hopes and aspirations. His diploma will surely stand him in good stead. His ideal was to graduate, the educational ideal. He is fitted for high school or for business and he has chosen to launch his frail craft upon the tempestuous voyage of business. His reasons for choosing a business career were

largely financial, the finances of the home. He has a job and proudly stands before his "boss" ready for orders, and behold! he is not asked; he is told, and, unaccustomed to receive orders, he fails to comprehend, and after a few days of failure he is "fired," and why? Because an educational ideal had never pictured to him the necessity of close attention when a task is assigned, once and once only, nor that time has value. He never was impressed with the fact that if forty pupils each waste five minutes a day the total is 200 minutes or $3\frac{1}{3}$ hours, that an employer pays for a boy's time rather than for his knowledge, that the time paid for must produce something of value to the employer and that the boy has no right to waste that which is of value to the one who pays for it. A right ideal would gradually accustom the boy, who will eventually somewhere become a member of a great industrial world, to each day keep an accurate record of all work assigned, the part completed, with a record of spoilage and why spoiled, the part the completed task is of the whole and then estimate his efficiency on the basis of a fair day's work.

When an industrial concern, after careful study, finds its efficiency not over 75 per cent the cause is sought out and the changes made increase the efficiency to the 100 per cent standard. In the educational factory the 75 per cent standard tends to produce a worker accustomed to low standards and his first serious problem is to adjust himself to the 100 per cent standard of the industrial factory.

In the educational factory let the boy be assigned the task of keeping the attendance record of the room for a month, and under supervision make the regular report. His arithmetic will then become real. Numbers will mean something. The student worker will then become a real worker. The boy in manual training may be charged a given amount for materials, time, and supplies, load the total with a certain per cent for overhead expenses and he will soon begin to realize that it costs something to run the educational factory. Credit him with the commercial value of the finished product.

If A's finished product is rated at \$2.00 and cost \$3.00, and B's product is rated at \$3.00 and only costs \$1.80 on the same basis as A's, will A then begin to figure on the difference in cost and soon learn to know the real value of time, as time was the main element that made the difference in cost?

In arithmetic, a right ideal is accuracy, rapidity and neatness. No task is so small that inaccurate results can be accepted. Bring the home and the school into closer touch. Figure costs of food, clothing, fuel, and lighting. The work can be made real, but not industrial. There are too many industries and special technical terms in each to attempt to teach the arithmetic of industry in the school. A boy

who has been trained to handle numbers accurately and rapidly, with a line gauge in hand, can be taught to compute numbers of ems in a given page set in 10-point type in about fifteen minutes, after he has been in a printing factory long enough to know what he is talking about, while it would take him hours to get the answer were he in an educational factory and knew nothing of the terms used. The effect of attempting to teach the arithmetic of the trades in the schools is as wrong an ideal as is the ideal of teaching the city boy to fence a quarter section with a five wire fence, or a country boy to find the cost of paving a city block; tho each may have certain elements in common, the facts are foreign to each other. As long as the educational factory attempts to do the work of the shop so long must the shop do the work of the school.

Let us return to our boy who lost his job. He next tries answering "want ads," and wonders why his letters bring no replies. The educational ideal had never made it clear to him that an applicant is judged by the letter he writes, the paper, the ink, the general appearance, the arrangement of sentences; even the spelling and the writing may enter the decision of the employment manager. Our discouraged boy little dreams that his G-r-a-m-m-a-r school graduate is the weak link in his chain. The manager decides that the boy is either ignorant or careless and under either condition does not want him.

If at least a part of the time spent in writing themes, compositions, or essays, much of the subject matter of which is copied from reference books, were given to practice in writing simple sentences until the learner becomes proficient in expressing himself in plain, concise English, whether in the arithmetic, the geography or the English class, then in time he might be able to read instructions, whether in the form of a simple experiment in science, an order from a foreman, layout, or a working drawing. All the textbooks ever written for English work will never replace the need of constant practice in the use of good English in all classes.

Competent counsel for the educational factory will require the services of men especially trained in both the industrial factory and in the educational factory, men that know fully the demands of the one and the condition of the raw material and of the finished product of the other. Men able to advise and to adjust the conditions to the demands. If the captains of industry must first serve in the ranks is it not equally necessary for the captains of the educational factories to serve in the ranks? It has been said that a good workman with a few months' training may make a good teacher, but a good teacher with a few months' training cannot make a good workman.

The new education may require a man that knows a little less of some things and a little more of other things, but will he lack training or culture? Does it

not take a trained mind to make a good mechanic, and was it not training that made it possible for him to become a mechanic? A special training, to be sure, but training nevertheless.

The industrial factory judges the educational factory by the product sent out just as the commercial world judges the product of the industrial factory. In industry the captains keep in close touch with the consumer and attempt to produce what is demanded. If the captains of the educational factories were in closer touch with the consumers of the product of their factories, then would the product find a ready market and be placed upon a commercial basis commensurate with the time and expense spent in producing the product. The waste in the educational factories is enormous, the product does not meet the demands of the consumer and everywhere the great army of unskilled workmen is increasing and the supply of skilled workmen is decreasing.

In the educational factories the superintendents of the various departments have practically the same general plan or system to carry out, while in the industrial factory each superintendent is a specialist in his line and is responsible for the product as developed in his department. Should the same system be developed in industry as in the schools, a city would have but one industry. Why should not the educational factories take into account the probable life activities of the raw material that comes to them and upon that as a basis develop a plant that will produce a product able to meet the demands of the consumers and thereby help to prepare efficient workers, able physically, mentally and morally to take a part in the industrial world and form a part of the good citizenship of the city. Would supernal common sense dictate that the same training be given the child who will in all probability be required by circumstances to go out as a wage-earner as soon as the law allows, as is given the child who will complete the grammar school, attend high school and then possibly attend college for four years before taking his place in the industrial army, probably on an equal footing with his brother worker, who entered from the elementary school at fourteen?

Will supernal common sense realize some day that while one boy may reach a position of power and influence against all obstacles there are dozens who thru lack of training and lack of proper leadership are destined to a life of inefficiency and unemployment, and from these ranks are filled the institutions of charity and reform?

Will supernal common sense some day cause the educational captains to confer with the industrial captains and reach a plan whereby the raw product that comes to the educational factories may be transformed into valuable raw product for the industrial concern, and with proper training and guidance under suitable terms of apprenticeship become a valuable and highly efficient product? The product

of the school, the boy, must learn the trade after he has entered the trade, not before, but he must be trained to be able to succeed in the trade, and common sense would dictate that the school should extend over into the factory rather than the factory go down into the school. The industrial manager, thru his subordinates, follows his product to the consumer. So must the educational manager thru his subordinates follow and guide the product of the school, keeping in close touch with the requirements of good schools, and of efficient workers, then will a new era dawn in our educational methods.

What does the 100 per cent mark of the school signify?

Has it a uniform meaning and can it be measured by some definite standard? Or is it Miss A's opinion of Johnny's answers to ten questions selected at random? Johnny's memory is active, possibly his textbook containing the answers is convenient. The answers satisfy Miss A. His mark is 100 per cent.

On ten other questions set by Miss B for Johnny, he is marked 50 per cent, and why? Possibly a lapse of memory, or no convenient textbook and Johnny's fate is settled. He fails to *pass* and must remain in the grade for another year and possibly is later eliminated among the retarded, as mentally deficient, leaves school, and school reports, to secure the active co-operation of parents or guardian, must contain information that is of vital importance. The average report showing scholarship standings based largely upon written examinations is satisfactory to the average child if he passes; the parents or guardian usually pay but little attention to the report, if the child makes no complaint, and the report is signed in a perfunctory manner and returned to the teacher. Much is being written and said about the inefficiency of the product of the educational factories. What are the standards in the educational factories? Are they high, or low? The usual pass-mark, or efficiency standard of the school is 75 per cent and the product of the educational factory, the boy, is expected to enter an industrial system when the factory standard is 100 per cent efficiency.

The boy honestly attempts to adjust himself to the new conditions, but often fails before the adjustment is completed and is discharged for inefficiency.

The quantity of work done in the educational factories is probably sufficient, the quality is not always entirely satisfactory. There are no definite standards as in the industrial factory and the boy takes but little interest in his efficiency standard or measure if he passes and continues to work with his class.

To secure the active co-operation of overseers, foremen and supervisors some corporation schools furnish the following data each month to parents or guardian.

Report of.....
For month ending..... 191.....
Dept..... Work..... Rate.....
Bonus earned.....

SHOP REPORT

1. Is he prompt?.....
2. Is he careful with tools and machinery, and of materials?.....
3. Does he apply himself to a job until it is completed?.....
4. Is he adapted to and prepared for the work he is doing?.....
5. Does he work well without supervision?.....
6. Does he work for results?.....
7. Has he energy in going ahead and doing things?.....
8. Has he ability to meet emergencies?.....
9. Does he get along well with others?.....
10. Is he improving?.....
11. Has he any serious faults?..... Specify.....
12. Has he any bad habits?..... Specify.....

Efficiency (Academic).....

Based upon school work

Efficiency (Shop work).....

Based upon factory work

Explanation—95-100, Standard; 85-94, Good, Under 85, Failure

To the Parents or Guardian

Careful study of this report, by yourself with the apprentice, will indicate to you the points upon which your son, or ward, needs to strengthen himself in order to reach a higher efficiency. The object of the report is to secure the co-operation of parents, instructors, overseers, and foremen, in order to secure a high degree of efficiency in the apprentice school.

Foreman

Supervisor

Overseer

Parent or Guardian

Parent or Guardian will sign and return

The standings are based upon the complete records, and all bonuses, vacations, or other special privileges are figured on the efficiency records. The success of the boy is measured more by the answers to the questions than upon a 100 per cent memory test.

Would it not be advisable in the public schools to furnish parents, or guardian, with information along similar lines and base efficiency standards upon a complete report where the time element is considered of some importance, as in the following scheme?

Work, either academic or trade, must be commercially good, that is, correct.

An estimated, or standard, time is set for each job, the time that experience has shown to be right for an efficient worker. As all work must be correct before being accepted, the standing shows the time that one takes to do good work as compared with an efficient worker. An efficient worker is one who completes a given job in a reasonable time, and the time must be determined by an analysis of the operations and motions necessary with material under normal conditions, or placed to the best advantage for the worker so that he loses no time hunting for material.

As the efficiency of good workers may differ no absolute 100 per cent can be set. The 100 per cent is a time that will allow a reasonable profit according to the estimated time made when the job is sold.

The record under these conditions becomes a time-basis mark. As one may beat the record and stand above 100 per cent, so he may lose and stand

less than 100 per cent. The average for a given period, as a month, is the efficiency mark. It may be represented by a graph and will then show the fluctuations in the daily work for a given period.

If the estimated time on a given job is eight hours, and the work is done in six hours, the standing will be above 100 per cent. The estimated time, eight hours, divided by the actual time, six hours, equals $133\frac{1}{3}$ per cent, the efficiency of the worker.

All privileges granted are based on efficiency marks. As no poor work should be accepted, *under any conditions*, and as lost time is one of the most expensive waste elements in any factory, whether industrial or educational, the efficiency marks should show clearly the time-basis, or be time-basis records, and then privileges will be granted to those who have made high time-basis records.

With data similar to the above, the parents and the boy would have a definite basis to determine success or failure as judged by the superintendent, the overseer and the classroom teacher. It might require a few more overseers, but the educational factory needs more supervision by experts.

The industrial factory has a superintendent over each department and under him foremen, and each one is a specialist in his department and knows what is expected of him in producing a marketable article.

An architect plans a twenty-story skyscraper and the contract is let for the building. Hundreds of miles away the steel is fabricated for the building. Each beam, each column has a place and must bear a given strain; the tests are made, the product is shipped; someone is responsible for the product, and as column after column is swung into place and the great building reaches skyward, is continued readjustment and re-arrangement necessary? No, for each piece of steel has its place and was planned for a certain purpose. From the foundation on the bed-rock a hundred feet below the street level to the highest point in the structure, there was a plan and a purpose. Each floor is complete in itself and must also bear the strain of the one above. When the great structure is completed the standard set is reached and the building is ready for use.

In the educational factory, where the most valuable of all materials is fabricated, how about the product when it reaches its destination? Will it fit? What is it to be used for? Must it all be fabricated alike? A great city requires many products, hence many different factories.

The educational factories can at least set certain standards in accuracy and accept no work below standard, whether it be English in a mathematics class, or design in an English class. No excuses on account of lack of time or energy should be accepted.

Quality, not quantity, work should be a standard. Tonnage may be all right in a steel mill, but even tonnage product must be standard.

Is there any excuse for a graduate of an ele-

mentary school to spell Grammar, G-r-a-m-m-e-r, or ninety, n-i-n-t-y, and then have his application rejected, as the employment manager decides that the boy is either careless, or ignorant? Is there any possible excuse or justification in his not being able to handle simple numbers rapidly and accurately? Is it not possible to teach him to read a simple order to follow instructions intelligently?

Probably not, so long as we are dealing with tonnage alone and even with that have no standard.

The habits formed in the educational factories are of more importance than the knowledge gained. Habits of accuracy, attention and industry can be taught in every class and in every grade, then with the little knowledge gained and correct habits formed the product will find a ready market.

The views of two authorities on scientific management on habits follow, as a fitting close to a plea for more attention to the habits formed in the educational factory:

"The habits that a man has to acquire to become efficient in one class of work stand him in good stead in becoming efficient in other work. These habits of work are vastly more important than the work itself, for it is our experience that a man who has become efficient in one thing, readily learns to become efficient at doing other things."

"As they (workmen) become more skilled, they form better habits of work, lose less time, and become more reliable. Their health improves, the improvement in their general appearance is very marked. This improvement in health seems to be due to a more regular and active life, combined with a greater interest in their work, for it is a well-known fact that work in which we are interested and which holds our attention without any effort on our part, tires us much less than that we have to force ourselves to do."—(Gantt—Work, Wages and Profits.)

The apprentice should not be permitted to depart from the standard motions in any case until he has first acquired them as a fixed habit. The most pernicious practice is the generally accepted one of first having an apprentice do perfect work and then attempting to make speed later. The right motions should be taught first, and the work taken down and rebuilt until it is up to standard quality. This is the only way to get the full benefits of the economics of motion study.

"Training" is so closely related to "skill" and "experience" that it is difficult to separate it from them. We use the word to mean both the worker's theoretical and practical equipment for his work, his entire preparation. The problem is to see that the worker has both kinds of equipment acquired in the most useful, balanced method possible.

The training of the available worker must always be considered in estimating the time that it will take him to acquire standard methods and the output that can be expected of him. The training of the worker of the future should be planned to fit him for standard work. The training of the apprentice on the work today is usually defective because he has little or no training in theory at the same time that he is getting his practice. Furthermore, the journeyman who is his instructor not only has had no training in pedagogy, but often lacks the benefits of the elements of a common-school education.

On the other hand, the boy taught in the trade school lacks training under actual working conditions. The question of dollars and cents to make for the employer, special fitting for high wages for himself, and the knowledge of the principles underlying the requirements necessary in order to obtain specially high outputs from intensive management, are wholly lacking.

It is a recognized fact that a cluttered-up floor under a workman's feet will tire him quite as much as the productive work that he is doing. A smooth-planked floor will enable a

bricklayer to lay many more brick than will earth that has been leveled off.

A bricklayer can stoop over and pick up anything from the floor with one hand with much less fatigue if he has a place to rest his other hand while he is stooping, because he puts his weight on one foot and lifts his other foot out behind him, which does not tire the muscles of his back nearly so much.

Slow motions do not necessarily cause less fatigue than quick motions, and, per unit of work done, may cause much more fatigue than quick motions.

The amount of work done per motion may not be fatiguing proportionately to the size of the unit.—(Gilbreth—Motion Study.)

WATTLSS TRANSFORMER

Edwin F. Judd, Montclair, N. J.



THE building of small battery motors has ever been of great interest and profit to seventh and eighth-grade boys. There is a fascination about handling the mysterious force that holds the interest as perhaps few other phases of mechanics do. To take materials and so place them in relation to each other that they produce motion when an electric current is passed thru them is little short of an Arabian Night's dream to every wide-awake boy.

The difficulty has always been to get the "juice" after the motor was completed. Batteries are expensive and last for a short time only. The mayor of our town once came to me and said, "You will have to cut out this motor business. My youngster has had charged to me in the last week six dollars' worth of batteries." To run these small motors we have found that a step-down transformer attached to house current, altho giving a pulsating alternating current, will run the series wound motors very nicely and at a cost of practically nothing. In fact we call the transformer a wattless transformer, for as near as I can estimate on the meter, it can be used fifteen hours for about one cent, which fact should be a very good recommendation for its use.

Thru a number of experiments we have been able to construct a transformer that will not blow the fuses nor over-heat, giving us a varied range of voltage that suits it for our use.

Without going into the technical details of calculating size of core, wire, and number of turns, I will try to describe as simply as possible our little wattless transformer.

Construction.

The core will be the modified H type.

Procure from the tinsmith some stove-pipe iron, 28-gauge, and unless you have a shear, have him cut it into 1" and $\frac{1}{2}$ " strips. You will need about 52 pieces 1" by $3\frac{1}{2}$ " for the main body, 52 pieces $\frac{1}{2}$ " by $3\frac{1}{2}$ " for the ends, and 52 pieces $\frac{1}{2}$ " by 4" for the sides. See Figs. 1 and 11.

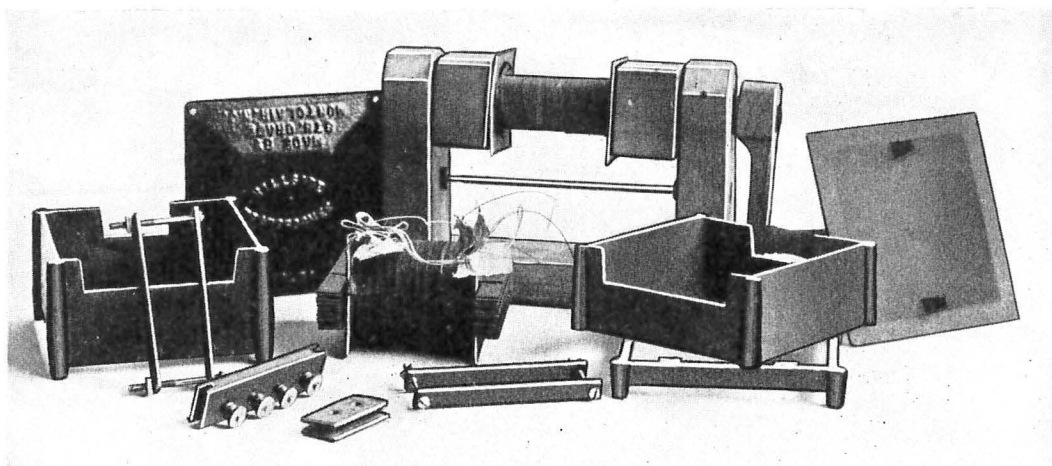
Before cutting into lengths, give one side of the strips a thin coat of asphaltum varnish thinned with about one-quarter turpentine, and allow to dry thoroly.

Make a box form as in Fig. 3 to build up the body of the core in. Take the 1" pieces; start by laying the first piece touching one end of core box (varnished side up), the second piece on the first (varnished side up), touching the opposite end of core box. Continue in like manner until a stack 1" high is obtained when compressed in a vise. It is necessary that the varnished sides be all laid the same way, that each piece may be insulated from its neighbor. Take from core box, clamp tightly with hand screw, drill $5/32$ " hole down thru center of stack, slip in a piece of $5/32$ " rod, and neatly rivet each end, filing head of rivet off smooth and as close as possible.

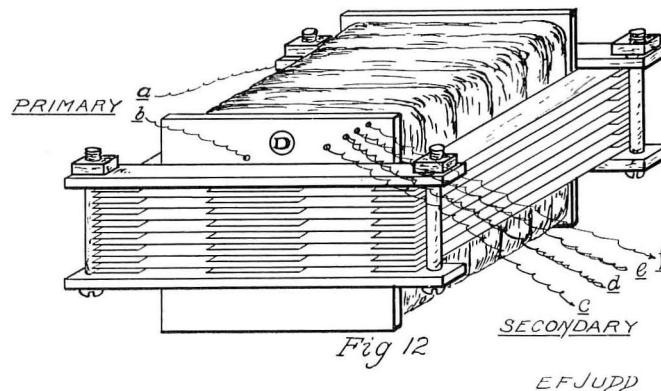
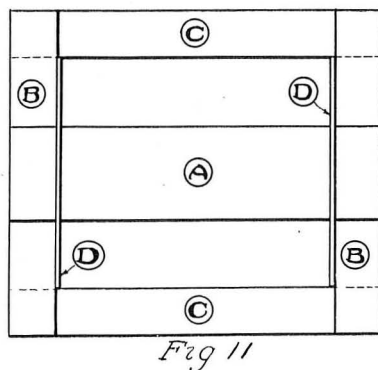
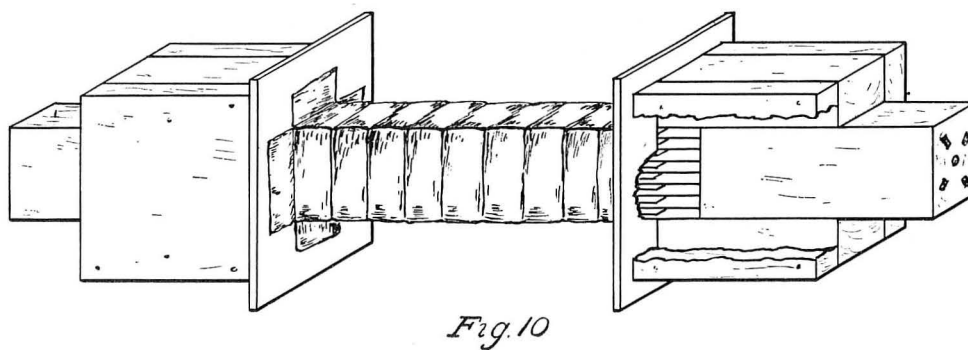
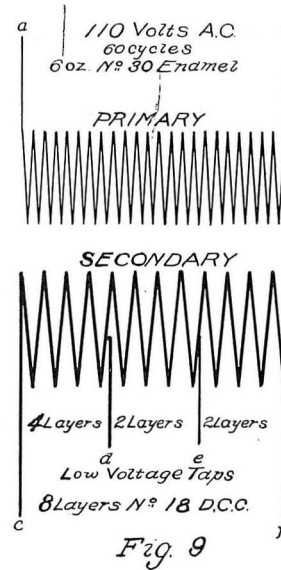
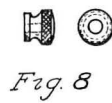
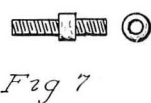
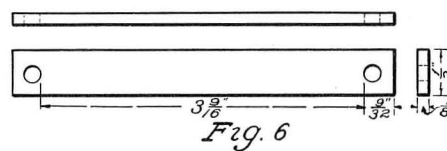
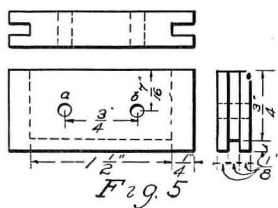
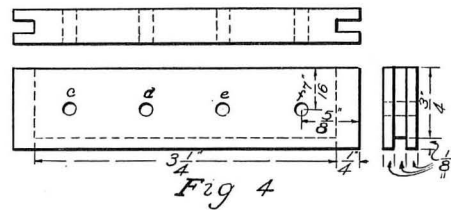
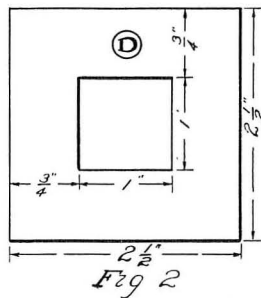
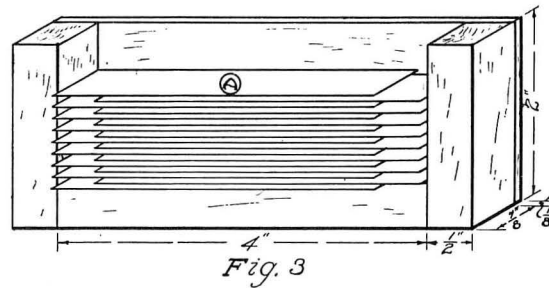
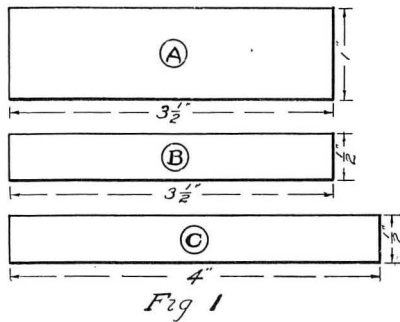
Cut from 1-16" fibre two $2\frac{1}{2}$ " squares with a 1" square hole in center, as in Fig. 2.

Compress core in vise and slip fibre flanges on ends of core, $\frac{1}{2}$ " from end, as in Figs. 10 and 11.

The winding may be done between the centers of a lathe by using two forms as in Fig. 10, or in a hand winder, Fig. 13. My experience is that the hand winder is much superior, in that the danger of



Transformer Parts, Winder and Pattern for Iron Box Container. In Center a Wound Core with End Strips Inserted.

WATTLSS TRANSFORMER I#

WATTLSS TRANSFORMER 2[#]

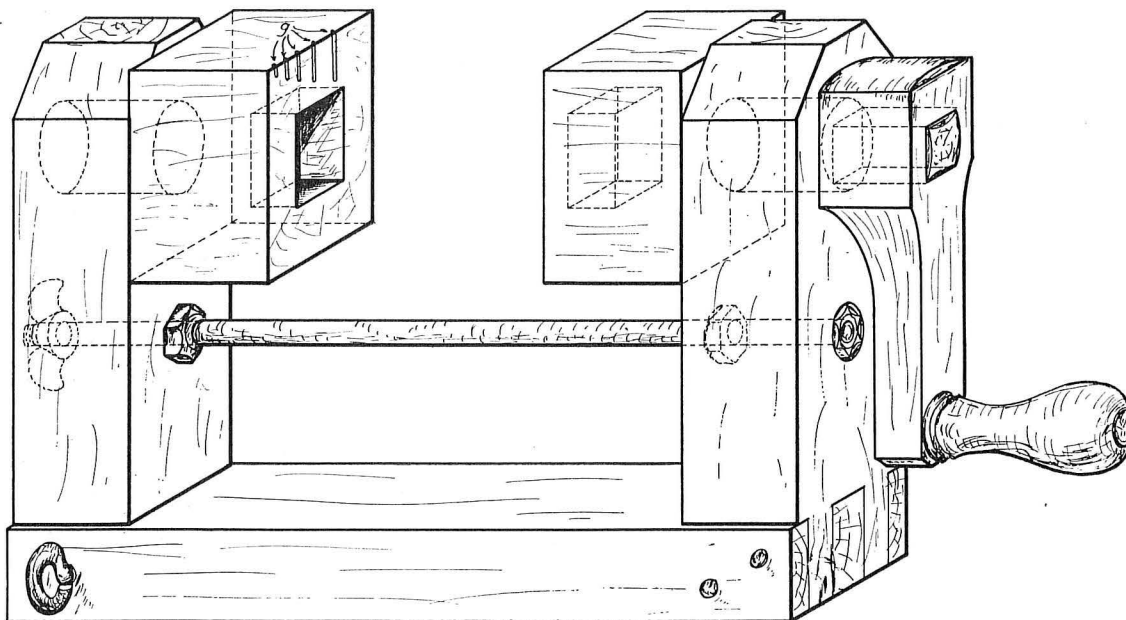


Fig. 13

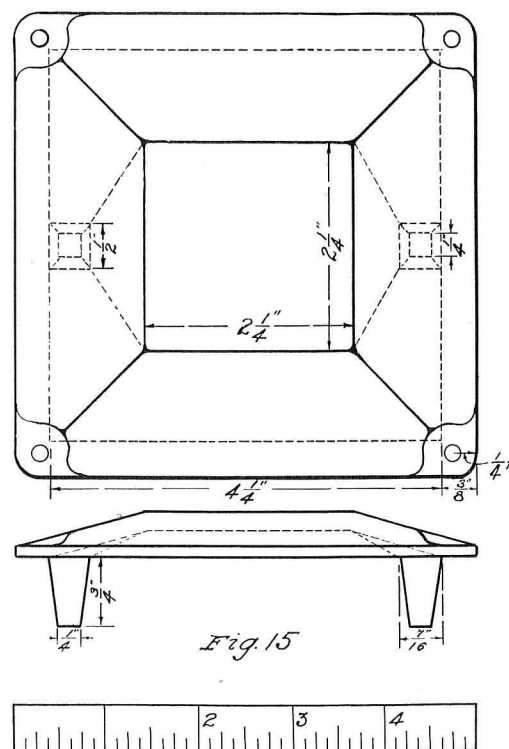
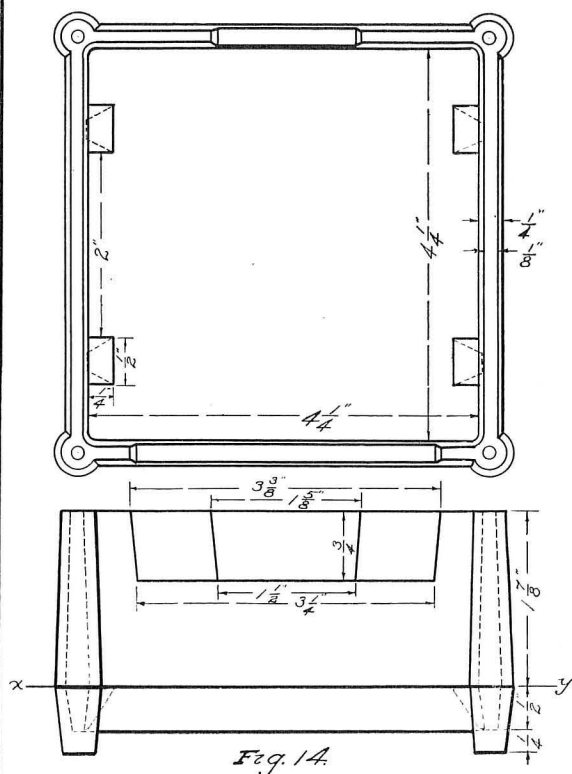
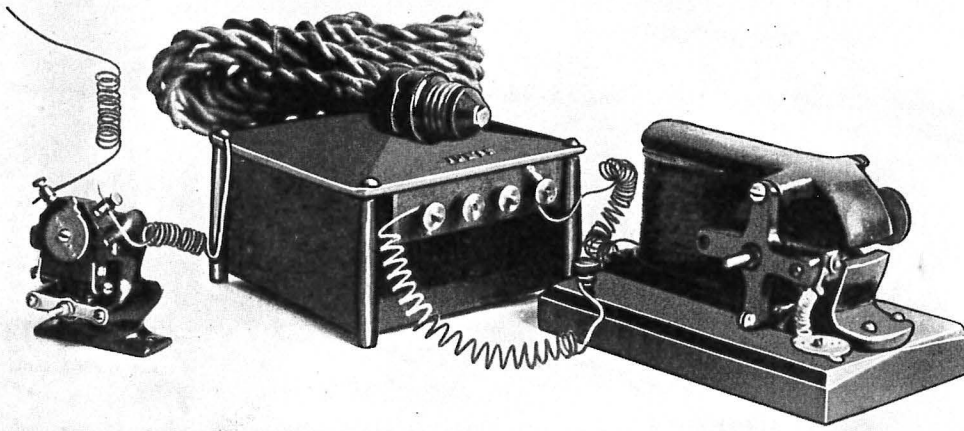


Fig. 15

E.F. SUPP.

CONSTRUCTION DETAILS OF THE WATTESS TRANSFORMER.



Finished Transformer and two motors that may be operated by it. The smaller motor is used in 30 in. model motor boats, the larger for operating spark gaps for wireless apparatus.

breaking the fine wire is avoided, it is done nearly as rapidly, and can be accomplished in a shop without machinery. Wind between fibre flanges two layers of cloth base rubber insulating tape, allowing it to extend up the sides of the flanges $\frac{1}{2}$ ", by slitting at the corners; over this with one layer of heavy wrapping paper such as is used in hardware stores, giving the paper a coat of shellac both sides and applying when tacky or nearly dry.

We are now ready for the primary winding, which will consist of 6 oz., No. 30 enamel magnet wire. With small drill or bradawl, make hole in fibre flange on top side near core, push about 12" of wire thru, winding in either direction and keeping as even as possible, bringing the end out thru the opposite flange. There will be about 3025 turns. Grooves in the winding forms should be cut where the wires come out thru the flanges, that the insulation may not be broken, as at "g," Fig. 13.

One layer of tape and one layer of shellaced paper are now put on to insulate the primary winding from the secondary.

The secondary winding comes next, and being of larger diameter wire, No. 18 double cotton covered magnet wire, may be laid on in perfectly even layers. Starting at one end, push 6" of wire thru a hole in flange, winding in the same direction as the primary, across and back twice, layers 1, 2, 3, and 4. There will be about 50 turns to each layer. Draw up a 6" loop and push thru hole in flange, then wind across and back again, layers 5 and 6; draw up another 6" loop and push thru flange; wind across and back with the final layers, 7 and 8, pushing the end of the wire thru the flange.

Each layer of the secondary may be shellaced as it goes on, and under the last layer place one layer of shellaced paper, that the final layer may be even and smooth. One layer of tape is added for protection, and if the work has been done carefully the winding should not protrude beyond the fibre flanges.

Remove from winding frame. Insert the $\frac{1}{2}$ " by $3\frac{1}{2}$ " strips between the projecting ends of main

core strips, allowing them to protrude equally at either side, with the varnished sides the same way as those of the body pieces. This accomplished, the side pieces may be inserted between the ends of the end pieces. These strips are firmly clamped together by placing a piece of band iron, Fig. 6, top and bottom at each end, using $\frac{1}{8}$ " by $1\frac{1}{2}$ " stove bolts, Fig. 12, to draw together.

The transformer may be mounted on a wood or slate base, or put in a sheet iron box. We have a pattern from which we have the boxes cast of iron, Figs. 14 and 15, giving a neat and finished appearance, and protecting the instrument in good shape. On account of the four lugs that the lower band iron clamp pieces rest on when in the box, it will be necessary to part the pattern at "x" "y," Fig. 14. The cover, Fig. 15, has two lugs that are ground or filed off sufficiently that they press down on the upper band iron clamp pieces, holding everything firmly. The cover is held with four 3-16" by $\frac{1}{2}$ " round head machine screws. One side of the box is notched to take a piece of fibre, Fig. 4, in which four binding posts, Figs. 7 and 8, are inserted. The beginning and end of the secondary winding are bolted and soldered to the binding posts "e" and "f" respectively; the loop at the end of the fourth layer to post "d," and the loop at the end of the sixth layer to post "e."

On the opposite end of the box is another notch that takes the fibre, Fig. 5. A piece of duplex light cord of suitable length is divided back 6" from the end; a single knot is tied; the ends put thru the fibre at "a" and "b"; a square knot is tied on the inside, and one end soldered to inside end, the other to outside end of the primary winding. These wires, both primary and secondary, should be taped and tied down, so that by friction or any other cause the insulation may not be broken, and cause a short circuit which might burn the fine wire, or cause a leak thru the box and uncomfortable results. With a separable attachment plug on the free end of the duplex cord your transformer will be complete.

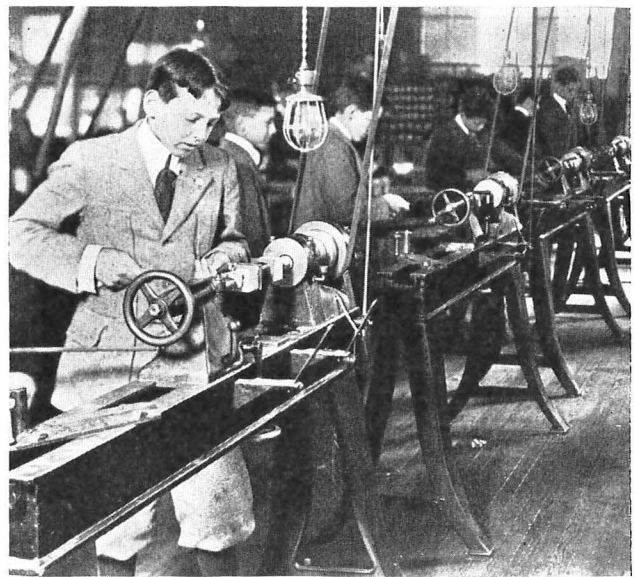
If you take current from "e" and "f" you will get 4 volts at 5 amperes; "d" and "e" you will get 4.1 volts at 5.3 amperes; "d" and "f" you will get 8.1 volts at 3.1 amperes; "e" and "d" you will get 8.4 volts at 3.3 amperes; "e" and "e" you will get 24.8 volts at 2.4 amperes; "e" and "f" you will get 32.3 volts at 2 amperes.

This transformer is for use on 110 volt A. C., 60 cycles only, as a step-down transformer. It must never be hitched up with the 110 volt flowing thru the secondary, for it will burn out in an instant.

The current may be used to run all kinds of small motors and bulbs of low voltage, as well as for testing out and experimental purposes.

We have built these transformers in the eighth grade as individual problems, also as a class problem on the factory plan. A boy working alone will build one in ten $1\frac{1}{2}$ -hour lessons. Working on the factory plan, when one boy makes, not the whole machine, but a single part, or does a single operation for the whole batch, we have turned them out in six $1\frac{1}{2}$ -hour lessons. The latter method is much more interesting for both teacher and pupil. A study of factory methods can be explained so that they understand some of the important issues, advantages and disadvantages. A spirit of co-operation is developed in a class that works out for good in many ways. The boys will check each other up, and woe be unto him that does his work poorly, for the work of each and every one contributes to the success of the finished product.

One of the big things that comes up in this problem is the study of the transportation of electric



Boys Winding Transformer Cores in the Lathe.

current from large power plants; how the current is hiked up to very high voltages thru step-up transformers for long distance runs, and is then brought down to usable voltages for all kinds of uses thru the step-down transformer.

When we first built these transformers in 1914-1915 the materials could be purchased for about 90c; today the cost is about \$1.75. The boys have always been willing to chip in and help pay for materials. Originally they contributed fifty cents, now seventy-five cents. It is a good investment on their part, for they can sell a transformer for three or four dollars.

JUNIOR RED CROSS ACTIVITIES IN THE INDIANAPOLIS ELEMENTARY SCHOOLS

Florence H. Fitch, Supervisor of Art, Indianapolis, Ind.



RED Cross work has kept sewing classes in the public schools of the country so busy that there has been little necessity for planning other problems for girls in intermediate and upper grades. But, contrary to current opinion that boys would not want to sew and knit, the boys of the Indianapolis schools have refused to be left out of this branch of active service. The constructive nature of the work appeals to them and they feel if our boys need these sweaters and socks, they should help make them. And so they knit before and after school and even on the streets, and take pride in the amount of work completed by their school. This spirit of co-operative service, aroused thru work and giving, is perhaps the greatest educational factor in the work.

If, however, a great amount of regular school time were devoted to merely repetitional work, it might be considered an unwise use of time supposed to be devoted primarily to educational purposes; but the process of knitting is a factor in the weaving

industry, and anyone who has lived thru the mysteries of heeling a sock will realize that some knitting is more than repetitional work, and requires the quiet of one's own apartment if the Red Cross standard of accuracy is to be reached, and the recipient of the socks not made lame by knots and ridges.

But this Red Cross sewing and knitting provides a form of service better suited to intermediate and upper grade pupils than to primary, and the little people want a share in the work. All *can* and *are* saving tin foil, paper, bottles and rags, and such work is valuable in its spirit of conservation and patriotic service. But children want to create, and rejoice in a beautiful article in whose creation they have had a share.

This led, in the Indianapolis schools, to a consideration of the possibilities for service in the regular elementary art handwork, and it was found that most of the articles which the children usually make for their own use or as Christmas gifts, were suited



A FEW RED CROSS ARTICLES MADE IN THE INDIANAPOLIS SCHOOLS.

to the comfort or amusement of the soldiers. So materials previously provided for the regular art handwork and the articles themselves were simply used for the soldiers instead of the children.

Primary children plan and make envelopes and boxes for use in school. Now they make similar ones to hold the cardboard checkers and dominoes made for the soldiers. Stick printed cardboard and paper dominoes originally designed for number games in school are now made for the soldiers. Clipping cases and joke books, filled with jokes and cartoons, and light weight checker boards of cardboard and paper, go to hospitals and Y. M. C. A. centers, with blotter pads and stationery cases for the letters home.

Perhaps most attractive of the amusement problems is the folding checker board just the size for a soldier's pocket. The squares are either stenciled by hand or block printed on the school press. In a pocket on the back of the checker board is an envelope holding button molds, dyed bright red and black, for checkers, while pegs, inserted in the holes of the molds, make kings.

For years second grade children have, as a part of their study of weaving processes, woven small rugs on hand looms. These small rugs of carpet yarn, many of them harbored for years by children now teachers in the schools, have been donated and assembled to make large, warm ambulance rugs for "over there," while the little rugs now woven of colored cotton warp, have been designed and combined to make most attractive floor rugs for the hospital bedsides.

Third-grade children want to knit squares for

the bed covers suggested by the Red Cross Society, and individuals *can*, but to teach one eight-year-old child to knit is one thing—to teach forty or fifty at once is another. Since in crocheting there is only one stitch to drop at a time, this seems a simpler process of weaving than knitting, and therefore not too difficult for third-grade classes. Crocheted squares proved as acceptable to the Red Cross as knitted ones and so crocheting was introduced as the regular handwork of the third grade, and the children crocheted 6" squares of bright colored Germantown yarn previously purchased for use in weaving a design on mesh cloth bags. They made small squares so all might learn the process and yet not spend hours in repeating the process when mastered. The necessity for accuracy in measurements so the squares would look alike and fit together to make a satisfactory whole, set a high standard for the work. The uniformity of results, as shown in the completed covers, made by combining squares from two or three different buildings, seemed quite remarkable when we considered the lack of uniformity often seen in the knitting or crocheting of older people.

The thought that only the best articles were to be sent to soldiers, placed a premium on neatness and accuracy in construction, while the desire to make them attractive gave an incentive for good designs and harmonious color schemes.

When the relief problems were assembled, several automobile loads of articles (for they ran up into the thousands) were sent to the Red Cross shop, and are now being shipped with the regular supplies to cantonments here, and camps "over there."

All this is relative to artistic construction work, but have we realized the vital service drawing and color are called upon to render in this war? Can we measure the influence of the posters, urging enlistment, conservation, production, and all forms of loyal service? How many thousands of lives have been saved by camouflage? Posters and camouflage,—opposites,—for one tends by forcing form and color upon the eye to call attention to itself and its message, while the other, by the distortion of form thru color, or by the matching of form and color, as seen thru atmosphere, strives to conceal. In preparation, then, for either form of art, the ability to portray form, by drawing, and a knowledge of the science of color and values, are requisite.

Children of grade-school age are not likely to be called upon for much camouflage service now, and it is scarcely their province to urge enlistment, but they can give definite help thru posters suggesting loyal patriotic service. At the same time they are gaining much in concrete thinking when they evolve concise,

telling slogans such as "Be Canny with Food," "Kill Kaiserism in the Kitchen," "Halt the Hun, Buy Bonds," "Serve to Win," etc. Even the little children can letter such simple slogans as Buy Savings Stamps, Save Tin Foil, and Bring Your Bottles. Intermediate grades can help suggest patriotism thru gardening posters such as Time to Plant, Make Your Yard Pay, etc. The grammar grades can make more elaborate posters for Junior Red Cross work, announcements of benefit concerts for the Fatherless Children of France, placards for Liberty Loan parades, Conservation slogans and War Savings Society Posters. All this gives fine exercise in lettering and poster spacing, to say nothing of the patriotic spirit aroused.

And so it is found that patriotic service not only suggests new educational problems, but proves the educational value of the regular school work which has been carried on for years with the development of the child and future citizen in mind.

JUNIOR RED CROSS WORK IN A HIGH SCHOOL

C. E. Partch, Des Moines, Iowa



THE question of what we can do to help in war relief work is one that has confronted the schools in all sections of the country.

A large percentage of the girls, even those as young as eight or ten years, have devoted considerable time to knitting, bandage and dressing work and the making of garments, but this work has been carried on under the direct supervision of the local Red Cross organization or by club groups and not under the direction of the schools.

Many schools have wanted to do relief work, many have done some work and have wanted to do more, especially the boys. Some manual training shops have devoted part of their time to the making of splints, crutches, etc., but the variety of work that the boys are capable of doing has been limited as compared to the field of activities open to the girls. This has been one of the factors that has made it seem difficult to handle the work as a school project. Some schools, rather than leave the boys out entirely, have encouraged them, as well as the girls, to knit and roll bandages.

The government bulletin on War Relief Activities for Schools, under date of December 10th, offers very little by way of suggestion for the boys of the high school to show their willingness to aid in the work. In January the faculty of West High School, Des Moines, Iowa, met and appointed committees to organize the school as a unit for the war relief work, and it was with the idea that each pupil should be given the opportunity to do his bit financially, as well as actually doing some of the physical work, that the committee started to plan.

A central committee, composed of a representative from each of the different departments of the public schools and representatives from the parochial and private schools, had previously acted on the suggestions offered in the War Relief Bulletin sent out from Washington. This committee reported back their recommendations to the schools so that the high school committee had these recommendations to guide them, but were in no way limited to these activities alone.

The recommendations of the central committee consisted essentially of the following:

1. Collections for membership should be considered as a school group and no individual should be made to feel that he must give.
2. Qualifications of a school to become a Junior Red Cross Auxiliary, i. e., when the sum of collections for the schools is equal to 25 cents per pupil.
3. Recognition school shall receive from central committee.
4. Duration of campaign.
5. Continuation of work previously started.
6. Handling of all moneys by the treasurer of the local Chapter and purchasing of all materials by the purchasing committee of the local chapter.
7. Suggestions for raising money.
8. Outlines for a week of patriotic programs as classroom work.

The committees appointed within the school were four in number: (1) publicity, (2) finance, (3) entertainment, (4) work.

The duties of the publicity committee were to keep the school informed at all times as to the na-

ture of the work being carried on and its progress from day to day.

The duties of the finance committee were to help raise money and to handle all moneys collected.

The duties of the entertainment committee were to prepare programs for the raising of funds and for the entertainment of convalescing soldiers at the base hospital located near Des Moines.

The duties of the work committee were to organize and plan work for the entire school, and to group the school into workable units.

The first necessary step was the raising of money. The amount necessary for a 1,400-pupil school to become a Junior Red Cross Auxiliary was \$350 and the committee considered raising this amount. The idea was given very little consideration, as the amount of money seemed too small, and the idea of letting the pupils' enthusiasm grow cold while waiting for materials from the purchasing committee was not a good one.

The committee finally set one thousand dollars as the goal to be attained, part of this amount to be returned to the Red Cross treasurer for materials and part to be used by the school for war relief work while waiting for materials.

The boys of the school, earlier in the year, had pledged to raise over four thousand dollars for the Boys' Y. M. C. A. Army Fund and over half of that was still unpaid. With this amount still to be raised the committee realized that raising additional money would be a more difficult problem than under normal conditions.

It was decided to raise the thousand dollars in three stages—the first amount of \$350 (the first line trench), necessary to make the school a Junior Red Cross Auxiliary, to be raised immediately by a self denial contribution to be taken up in first-hour classes. All pupils were urged to contribute only what they could by denying themselves something.

The committee considered it advisable from a psychological point of view that the pupils of the school should be shown graphically what they were striving for and just where they stood at all times. In order to do this the manual training department made a scale about 22 feet in length, graduated from zero to one thousand dollars in twenty-five dollar steps.

Along one side was a groove with a pulley at top and bottom. A continuous rope thru these pulleys was attached to a rider running in this groove. Attached to this rider was the indicator in the form of a soldier in uniform, eighteen inches tall, looking and pointing at the figures at the side. The indicator was made in the art department and was introduced to the school as W. H. Samuel (W. H. S.), otherwise known as "West High Sammy." The aim of the school was to take the first and second line trenches and then put him "over the top" by three separate drives.



Stage of the Auditorium of the West High School, Des Moines.
Sammy and Sally are shown at right.

Each class, as soon as it reached one hundred per cent, was given a Red Cross flag with a one hundred per cent sticker and an additional sticker for each one hundred per cent raised.

The custodians of the school asked if they might be privileged to add their bit to the collection, and they drew a service flag with four hundred per cent the second day and guaranteed to add enough to equal or to exceed any other group.

Several teachers agreed with their first-hour classes that they would put in as much as the class collected and this spurred on the class to greater efforts.

The second day netted \$223, so that Sammy captured the first line trenches and was well on toward the second before the first drive was finished.

On the second day a group of girls in a domestic art class, feeling that the boys perhaps had more spending money than the girls, decided to go without lunch for one day—a real self-denial—and give what they usually spent in the cafeteria for lunch to the collection. This placed them in the lead for the second day's drive and fourth from the top in the two days' drive.

One study-room of freshmen, sixty boys and one girl, who had been in the school only five weeks, decided they wanted to have a self-denial contribution flag. They chose a flag with a black background, rectangular in shape, and for every quarter collected a one-inch white circle was pasted on the flag. The boys insisted that the girls' contribution should be represented by a larger white circle placed in the center of the flag. Black was chosen as the background, that it might symbolize the Kaiser's dark prospects for the future, and white was chosen for the circles, for white has always stood for peace and purity.

The third day's drive placed Sammy up to the \$675 mark, giving the school in just one week after appointing committees, sufficient money to become a Junior Red Cross Auxiliary and a surplus large enough to start relief work immediately.

The class that won the highest per cent (408

per cent) did so by handing in its contribution on the third day in the form of a promissory note, payable on demand, agreeing to pay two per cent more than any other class in school.

The entertainment committee, by the last day of the drive on self-denial contributions, had drawn up a program for a series of twelve entertainments, one to be furnished by the faculty, five by the literary societies, five moving picture programs, and one home field meet, to be a school picnic if the weather will permit. The "movie" programs offered would cost the pupil down town from fifteen to twenty-five cents for each performance plus war-tax and carfare. A book of twelve tickets was offered for sale at fifty cents for the series, and a thousand books were printed with the idea of raising five hundred dollars by this method. The sale on the first day was 1,008 tickets, so that an additional thousand books were printed and they are nearly sold out. The performances, instead of being given in the afternoon alone as originally planned, will have to be given both afternoon and evening to accommodate the crowds.

The finance committee had planned well, but they had not prepared for the present situation. They did not think it wise to bring Sammy down and make him travel over the ground again, so he was fastened to the top of the scale, the rider brought down, and "Sally," dressed as a Red Cross nurse, was fastened to the rider and started to climb. She has climbed to the \$675 mark already.

The committee expects that the single paid admissions at the door will pay for the rental of the films and for the incidental expenses of the entertainments. All moneys collected above expenses this year for class plays is to be turned into the fund for Red Cross work, so that Sally has a good chance of fulfilling the cherished hope of the school that Sally and Sammy shall "go over the top" together and that two thousand dollars shall be the final goal.

The work committee had not been idle while waiting for money and material. They first visited the base hospital at Camp Dodge and found that for the new convalescent wards being built they would need comfortable easy chairs, card tables, curtains, to make the wards more attractive, and something for amusement to help pass away the time.

The boys in the manual training department immediately started making one hundred game boards, Red Cross Solitaire (shown in the March, 1918, *Industrial-Arts Magazine*), as being the thing they could do best to give immediate results. The boys, in turning, have made twenty sets of drum sticks for a drum corps being started at Camp Dodge. Miniature bridges, forts in various sizes and trench forms were made for the Officers' Training School for playing the "war game" on a sand table. Bulletin boards have been made for the Y. M. C. A. buildings, and as many morris chairs, rockers and card tables will be made as the finance committee will give the manual

training department money to pay for materials.

The girls in domestic arts classes have made the bags for marbles for the game boards and the art department made pasteboard boxes and decorated the covers with appropriate designs.

The girls in domestic science classes are planning to furnish boxes of sweets, such as only girls can make, to be sent to fifty of the West High boys who are in the service and were in school when war was declared.

The editorial staff of the high school paper has taken it upon itself to see that a circular letter telling of school activities and items of interest is sent each month to each of the fifty enlisted boys.

A questionnaire was sent to each study room and the pupils were asked to give one hour's time per week for them to sign up for the day preferred and the kind of work they could best do. From these questionnaires small groups will be organized so that the work will be carried on each hour of each school day of the week. Rooms are being fitted up with tables for work, and as soon as our materials arrive, these groups will be put to work on knitting, rolling bandages, making surgical dressings, comfort kits, etc. This work will in no way interfere with the regular work of the school, as the pupils devote only one period per week.

The work committee, in reporting that something was needed to help entertain the soldiers in the convalescent ward, started the entertainment committee to work again. They have, as a result, planned a program for one afternoon each week to be furnished by the pupils of the school. The boys' quartet has gone out twice and taken a reader with them. The boys report that the applause and thanks which they have received have been most hearty and they have been more than repaid for their effort.

The problem of transportation to and from camp was solved by organizing a volunteer automobile squad. An automobile company has offered us the use of their trucks for any hauling if we will furnish the drivers. These drivers will be picked from this automobile squad.

Further plans for raising funds are being considered, such as the profits on the sale of ice cream and chocolate in the cafeteria as soon as the weather is warmer, and the organization of a Red Cross War Garden Club, the garden produce raised to be sold at the municipal market and half of the profits to go to the general fund.

The plans are working even better than the wildest dreams of the committees—nobody is a slacker. There is a very intense and friendly rivalry between classes within the school, but the whole school rejoices with the winner. The school spirit is keener and better than at any time in its history. Each pupil seems to feel it his patriotic duty to his country, to his school and to himself to do his bit to make the Junior Red Cross work a success.

PREVOCATIONAL TRAINING FOR GIRLS AS CONDUCTED BY THE NORTH BENNET ST. INDUSTRIAL SCHOOL, BOSTON

(Conclusion)

George C. Greener, Director

Household Arts Courses—Manual Courses.

In the report on "Vocational Secondary Education" prepared by the Vocational Education Committee of the National Education Association an attempt is made to draw a much-needed distinction between domestic science instruction which is vocational and that which is not. According to this report, vocational home-making education is that which directly fits for home-making as practiced by the wife and mother in the home or by wage-earning household employes. All other forms of instruction and training based upon the occupations of the home or household are included under *household arts education*. The purpose of household arts education is to promote higher standards of appreciation and utilization in the field of home-making activities and to promote right conceptions of the social importance of the home. Household arts education may thus be made a large factor in the liberal education of womanhood.¹

In agreement with this distinction, the principal household activities are taught in the prevocational materials rather than as specialized processes. In these courses, as well as in the courses which are drawn from trades outside the home, the aim of the prevocational class is to give the pupil a *practical knowledge of*, but not necessarily *skill and expertness in*, several vocations. The guiding aim of the whole work is to increase their sense of responsibility, their self-reliance, and their general efficiency.

Content of Household Arts Courses.

First Year—Cooking.

Food Classification.

- I. Fuel Foods.
 - A. Carbohydrates:
 1. Starches: Cereals, legumes, starchy vegetables.
 2. Sugars:
 - a. Cane or beet: Brown, granulated, confectioner's, domino, molasses.
 - b. Fruit.
 - c. Maple syrup.
 - d. Milk.
 - B. Fats and oils:
 1. Animal.
 2. Vegetable.
 - II. Tissue building foods:
 - A. Proteids:
 1. Dairy products: Eggs, milk, cheese.
 2. Flesh foods: Fish, meat, poultry.
 3. Vegetable products: Legumes, nuts.
 - III. Acid and salt-supplying foods:
 - A. Fruits.
 - B. Vegetables.
 - C. Condiments.

Marketing.

- I. Relative value according to cost.
- II. Foods in season.
- III. Conditions of markets.

Cookery.

- I. Starchy Foods.
 - A. Effect of heat: Illustration, application.
 - B. Moist cookery: Boiled potatoes, boiled rice, lemon sauce.

- C. Dry cookery: Baked potatoes, pop corn.
- D. Cereals: Kinds, manufacture, cookery, cream of wheat, oatmeal, etc., relative cost of package vs. cost in bulk.
- E. Vegetables: Creamed carrots.
- F. Desserts: Cornstarch mold.
- G. Sugars:
 1. Stages of cane sugar cookery: with liquid, without liquid.
- Applications: caramel sauce, fudge, cocoanut, cream candy.
- H. Batters and doughs:
 1. Pour batter—popovers.
 2. Drop batter—muffins.
 3. Soft dough—baking powder biscuit.
 4. Hard dough—molasses cookies.
- I. Ingredients for lightening and shortening: baking powder, soda and acid, yeast.
 1. Breads—quick rising.
- J. Cake.
 1. Butter—plain cake.
 2. Sponge—sponge cake.
- II. Proteid Foods.
 - A. Effect of heat: Illustration, application.
 - B. Milk.
 - C. Cheese.
 - D. Eggs: Hard and soft cooked, custards, Delmonico pudding.
 - E. Fish: Oyster stew, boiled haddock, creamed cod fish, broiled shad.
 - F. Meat: Beef stew, pork chops, pot roast, fricassees, roasts.
- III. Fats: Frying doughnuts, sauteing griddle cakes, pastry.
- IV. Special lessons: Soup-making, gelatine, basket lunches, frozen mixtures, salads, dressings, making of menus, school and workmen's luncheons.

Second Year Cooking—Senior Class.

The cooking instruction in the second year is based entirely upon the buying, preparing, and serving of foods for the public lunch room. The principles of cooking taught the first year are applied in a practical way in the second year.

Sewing.

The two-year course in sewing is formed on the same lines as the course in cooking, beginning with the most elementary processes and finally including the making of aprons, undergarments, and children's dresses. The second year includes a review of the technical processes of the first year and the application of these to dressmaking, advanced embroidery and order work. Visits to embroidery stores and garment shops are made.

General Course.

For First Year Juniors.

Small models showing:

1. Sewing stitches: Basting, running, overcasting, overhanding, backstitch, half-back stitch, hemming, hemstitching, buttonhole stitch.
2. Mending: Hemmed patch, overhanded patch, flannel patch, weaving as applied in stocking darning and cloth darning, straight and bias darning.
3. Dressmaking processes: Plain seam, French seam, felled or flat seam, straight and bias facing, piping, finished plackets (three ways), gussets, setting gathers into band, fastening embroidered edge to cloth, plain and gathered, sewing lace to edge, scalloped edge as used in doily, set of fastenings, showing button and buttonhole, hook and eye, ball and socket fasteners.
4. Embroidery: Outline stitch, chain stitch, blanket stitch, damask stitch, feather stitch, French knots, dot and eyelet embroidery.
5. Use of various commercial and homemade patterns.

Articles Made—First Year.

1. Towels: Dish, hand, roller.
2. Holders.

¹ Report on Secondary Vocational Education. Prepared by the N. E. A. and published by U. S. Bureau of Education, p. 49.

3. Sewing bag.
4. Aprons: Housekeeping, tea, cooking, waitress.
5. Curtains.
6. Three of each of the following groups:
 - a. Child's garments: Skirt, waist, drawers, aprons, night-dress, dress.
 - b. Girl's undergarments: Skirt, waist, drawers, aprons, night-dress.
 - c. Fancy articles: Hemstitched or embroidered towel, bureau scarf, embroidered sofa pillow, embroidered collars and cuffs.

Articles Made—Second Year.

1. Lunch room dress.
2. Christmas articles: Handkerchiefs, belts, fancy bags, embroidered collars and cuffs.
3. Three of the following: Baby's dress, baby's shirt, baby's bonnet, baby's jacket.
4. Set of miss' underwear.
5. Plain shirt-waist.
6. Plain wash dress.
7. Graduation dress.
8. Order work: Napkins, dish-towels, hand towels hemmed by machine, napkins hemmed by hand, guest towels, embroidered or hemstitched, letters or monograms, doilies, center pieces, collars, etc., embroidered, aprons of all kinds, children's skirts, waists and plain dresses, fancy bags, underwear, sofa pillows, curtains, holders.

Laundry.

The lessons begin with two or three kinds of articles—napkins, towels, bed linen—selected for washing. As the lessons progress, one or two new problems appear in each, until the complete list has been gone over. During all lessons, discussions are held as to the most convenient, economical, and efficient materials and methods. Visits to public laundries are made for the purpose of studying equipment, processes of disinfection, and bleaching of clothing.

The content of the course is given in the following outline:

- I. Washing.
 - A. Preparation: Collecting clothes, sorting, removal of stains, soaking.
 - B. Method of washing: White cotton and linen, colored cotton and linen, woolen, silk, delicate fabrics such as lace, fine embroidery, etc.
- II. Starching: Boiled, cold.
- III. Hanging and drying: Open air, warm room, dryer.
- IV. Folding and sprinkling.
- V. Ironing and airing.

Housekeeping.

The housekeeping course teaches the orderly care of kitchen and dining-room. In the senior year, visits are made to department stores for the purpose of studying equipment and furnishings of the different rooms in a house. Visits are also made to industries where food products are manufactured or packed.

The content of the course is given in the following outline:

1. Care of kitchen equipment: Stove, sink, cupboards, tables, utensils, scouring of sauce pans, cleaning of steel silverware, and brass, washing of towels, cleaning windows.
2. Dining room: Daily duties—clearing after each meal; monthly duties—cleaning of windows, washing curtains.
3. Bedroom. Toilets.
4. Application of various processes in the work of the lunch room: Washing dishes and utensils, washing towels, cleaning tables and floors, dusting.

Standards of Work.

One of the aims of these classes is to help the girls to comprehend the meaning of industry and to prepare them for honorable and successful vocational careers. It is especially important that the industrial courses given by the school should not inculcate a dilettante attitude toward work on the part of the pupil. The girl's work should be real to her. Real

work is necessarily difficult, demanding the maximum effort, both mental and physical. The school must constantly seek methods of making the industrial work both practical and educational.

One of the best methods of making tasks real is the doing of order work by the class. The connection with the outside world is strengthened by the filling of orders, and the influence of outside standards of work is thus introduced within the schoolroom atmosphere. To make a real towel that is ordered by a real person for a real use and is bought with real money has more value educationally than the construction of a more elaborate article with no such definite end in view.

It is necessary, of course, that order work should not be allowed to interfere with the normal and orderly development of the instruction. It should be introduced, not as a casual interruption, but as an organic part of the course. It should not be given to very young children and there are certain lines of work in which it should not be encouraged. But with these reservations in mind, a certain amount of incidental order work can be done with profit by the prevocational class. Thru it, the girls learn that speed is a very important part of successful production and that time—even the time of school children—has a value which can be measured and calculated. The financial profit is little emphasized by the school, but the class should not do work at a loss, for the training in business methods is one of the chief educational features of the prevocational class.

Order work is given by friends of the school and visitors. It is dovetailed into the course according to whether the pupil has time and is otherwise ready for it. An effort is made to give some order work to each pupil, as it affords excellent training in accuracy and in avoiding waste of material.

Household Arts Applied.

Another demonstration of the principle underlying order work is the commercial lunchroom conducted by the girls' prevocational class for their second year cooking course. The lunchroom was started in 1912, and has proved one of the most interesting and practical experiments of the school. The work is real work from every point of view. The experience which the girl gains there has the widest possible application, for it not only gives her an insight into a vocation of growing importance to women—that of catering—but it also prepares her equally for efficient service within her own home.

While the household arts teaching aims to promote the personal development of the girls in the sense that it seeks to continue their general education until the age of 14, this does not imply that the pupil's attention should be centered entirely on articles for her own use. On the contrary, she should be taught to view her own activities as having a definite exchange value in the world of industry. The chief value of the lunchroom is that it vitalizes the house-

hold arts instruction by the introduction of a genuine vocational motive.

An Educational Lunchroom.

The history of the Paul Revere Lunchroom shows that so valuable an adjunct to the domestic arts courses may be achieved without difficult or elaborate preparations. The senior class, by whom the experiment was started in 1910, consisted of eighteen girls with rather more than the average amount of energy and initiative. A year before, the practice had already been instituted of serving lunch to twelve teachers in the small, family-size dining-room upstairs, but teachers and pupils felt that an enterprise on a larger scale could easily be managed.

An unused room on the first floor was chosen for the experiment. The boys' prevocational class was set to work to make the necessary interior alterations, and in two weeks' time the place was ready. A neat kitchenette was constructed in one corner; show cases were built in the window for the exhibition of handiwork from the North Bennet Street School; the walls were covered with dull blue burlap and the woodwork was stained black. In the sewing room, dull blue wash dresses with white cuffs, collars, and caps were made for the eighteen waitresses and a supply of doilies, towels, and curtains were also manufactured. Seven round tables, accommodating 28 people, formed the initial equipment. But other tables had to be added and the lunchroom continues to have all the patrons that it can conveniently serve.

This fully equipped lunchroom, catering to public school teachers and others in the neighborhood, is an integral part of the curriculum. The class is divided into groups of six, each division taking charge of the luncheon in turn. The girls decide on the menu, buy and prepare the food, and serve the luncheon from twelve to one o'clock. In the afternoon, they compute the cost of the luncheon. The accounts on which they work are no mere paper affair. They know the cost of food from the butcher and grocer for that particular day, also the profit and loss each day. They are dealing with real problems, whose solution brings to them the satisfaction that a well-chosen occupation should bring.

The lunchroom is also a practical lesson in co-operation. The girls realize what it means to be dependent upon each other. In order to have the luncheon ready promptly at noon, they must specialize in team-work. They have learned to work in silence and to come and go from a very crowded little kitchen without getting in anybody's way and to move about among the many tables and chairs without accident. To do their work successfully, they must develop attentiveness, self-reliance, and a regard for the rights and privileges of others. When we consider that these girls are between 12 and 14 years of age, we realize how great is the potential value of this early experience in real co-operation. The best evidence

that they are learning the lesson is found in the high standards maintained by such youthful caterers.

New Occupations for Girls.

It would be inconsistent with the spirit of the prevocational class, if the list of occupations from which educational materials are drawn should be regarded as a closed one. While it is desirable from the practical point of view to draw mainly upon those industries in which women are largely employed, new occupations and changing conditions should not be ignored. The industrial work of the class in the beginning, centered almost entirely around household arts and their application. At a later date, box-making was added. More recently still, the girls have taken up the study of the printing trade.

The junior class, consisting of twenty girls, was started in printing during the past year. Tho this is the most recent experiment of the school, it has already justified itself from the educational and prevocational point of view. The girls like the work very much and "take hold" even better than the boys, while some of them have shown marked ability. The plan is to continue the work during the junior and senior years with the idea of directing those girls who seem best fitted for it into the printing trade. In this trade, women are recognized by the Union on the same basis as men. It seems, therefore, but right that the school should give girls the opportunity of fitting themselves for employment in this industry. The field is undeveloped, but not closed, and the development of new fields is one of the functions of a prevocational class for girls, since women are especially prone to fall back into unskilled work as a result of their over-concentration in a limited number of industries.

The Printing Course.

The content of the printing course has not yet been worked out with such detail as the long-established courses in household arts. The outline of the work, however, is given here to indicate in a general way what a brief course in printing for girls between 12 and 14 may include.

The first twelve lessons illustrate the general principles of:

- Sentences.
- Paragraphs—One line, two lines, several lines.
- Word spacing.
- Quotations.
- Leaders and double columns.
- Figures.
- Poetry.

After the first twelve lessons, during which the subject matter is supplied to the girls in order that their attention may be entirely given to the matter of mechanics, the printing work is made to correlate with the regular academic and industrial work. The full course is planned to include the principles and practice of the use of type, stone work, proof-reading, and press work.

Size of Classes.

The limited size of the prevocational class is an important factor in its success. If the regular grammar school classes were similarly limited, they would also, without doubt, show better results. It is one of the faults of the academic curriculum that the work in itself does not seem to impose an automatic check on the number of pupils to whom it can be given at the same time. Academic instruction implies a *receptive* attitude of mind on the part of the pupil with as little physical activity as possible. When the teacher is failing most to reach the pupils individually, the fact need not be strikingly evident to the chance observer. In the prevocational class, on the other hand, each child must be allowed his room for his *activities*, as well as for his person. Thus it is potent to everyone that such work can only be done in limited groups of children.

Concerning the additional cost of smaller classes, Professor F. M. Leavitt very justly says: "The argument will be made that the small classes are too expensive, but it should be recalled that the *per capita* cost of the high school is sometimes two or three times that of the grades. These children are entitled to small classes because they are essentially of secondary grade, or at least of the age which would normally admit them to the smaller classes and more expensive organization of the high school. They also deserve special consideration in view of the fact that, in all probability, they will spend but two or three more years in the day school before going out to assume self-responsibility."²

For the academic work the ordinary schoolroom desks and chairs are used. In the sewing room inexpensive sewing tables with low chairs are provided.

Relation to the Public Schools.

The plans of the girls' prevocational class are subject to the approval of the Board of Superintendents of the City of Boston. Pupils are selected by the principal of the public school from which they come and the principal is officially the head of the girls' prevocational work. The North Bennet Street School arranges the courses, devises their content, employs the teachers, and bears the expense of the experiment. The work which is offered is really prevocational; it is something more than the intensified form of manual training, with more time given to cooking and sewing. It seeks to give the girls an opportunity to "find themselves" vocationally. While it is possible for the pupils to continue their education by taking a high school course if they desire, the aim is to select those who must go into industry early and especially need this opportunity. A special certificate from the public school is issued to those who satisfactorily complete the work.

In the development of the girls' prevocational class, the North Bennet Street Industrial School has fulfilled its distinctive function of co-operating with

the public school for the purpose of making experiments. The first kindergarten for public school children was started in the North Bennet Street School in 1881 and was taken over by the city in 1887. In 1883, the first public manual training classes were opened in this building. In 1907, the girls' prevocational class was started and the boys' prevocational work followed in 1909. The city took over the prevocational work for boys in 1914 and has extended it so that there are now eleven prevocational centers within the public school system. At the present time, the North Bennet Street School affords a practical demonstration of the value of prevocational classes for girls and suggests that similar work might well be undertaken by other communities and by the public schools to meet a similar need.

Qualifications of Teachers.

To carry on a girls' prevocational class successfully, especially in the initial stages, a teacher with unusual resourcefulness and initiative is needed. The absence of precedent and tradition should make this field attractive to teachers who possess originality and inventiveness, and who would find little scope for these qualities in the strictly academic schools. The prevocational teacher needs to have a large fund of human sympathy in order that she may enter into the personal problems of her pupils. These girls, who are approaching an early contact with the problems of real life, need the utmost help that wise and sympathetic guidance can give them. The teacher must be able to enjoy the teaching of realities as well as the teaching of abstract things if she is to give them the assistance they most need to cope with the immediate future. This is not likely to be the case with a teacher who is trained along academic lines alone. The necessity of obtaining instructors who have a definite knowledge of industry and, if possible, some experience in it is clear, especially for the beginning of the work. The growth of the prevocational work will naturally increase the supply of teachers who sympathize with its aims and embrace its methods.

Some Results.

The girls' prevocational class of the North Bennet Street School has been in existence for about ten years. We have endeavored to reach girls from 12 to 14 years of age who would desire, from the influences of such a class, to stay in school until after they were 14; to reach those whose interest in school had waned and who might be stimulated to remain because of more opportunities in manual and industrial work; and further, to give girls who finally find that they must go to work, some definite means of trade selection and trade preparation, and to equip, as far as possible, our young people with training that would deflect them from the unskilled trades. It has accomplished its general purpose and achieved encouraging results. The attendance has been generally regular and prompt. The atmosphere of

²Prevocational Education in the Public Schools. F. M. Leavitt and E. Brown. Houghton Mifflin Co., Boston, 1915, pp. 79-80.

the schoolroom is one of easy unrestraint; no energy is wasted in the rigid enforcement of discipline for effect. The girls are free to move about at their work and they are able to do so and remain intent upon their tasks. On the whole, the work has stimulated in the class an intelligent appreciation of industrial life and its processes. It has developed habits of industry and given to the pupils the idea of productive and constructive work. It has encouraged the spirit of co-operation, on which personal and economic success depends in modern life and in which working women are so generally lacking. Thru the prevocational class, the daily life and daily interests of the school have been brought more closely into touch with the daily working life to be lived after school days are over. The various class activities have helped to reveal to individual pupils their peculiar bent so that the choice of an occupation need not be blindly made.

Thru the vocational guidance and placement bureau of the school, the girls' choice of further schooling or occupation is intelligently directed. A woman secretary, who gives her full time to this matter, assists in securing for the girls to a greater or less degree the value of their educational training—by helping them to continue that training, or to get a proper start in industry. While this bureau is intended to meet the immediate situation as found in these classes, it has the added purpose of making a deeper study of vocational guidance and the placement question as a contribution to the field of education. The work includes interviews with the children, visits to their homes, investigation of suitable industry, plus placing the children therein and following up their advancement.

In the spring of 1912, a study was made of the industrial and school records of the girls' classes of 1910 and 1911. The class of 1910 numbered fifty pupils. Of these, ten girls were still in school when the study was made. Of the other forty, one was a cashier; three were in the needle-trades; three were salesgirls; two bundle girls; one was a cash girl; one, a pottery worker; one, a jewelry factory worker; three were shoe factory workers; one was a cracker factory worker; nine were in candy factories; three were keeping house for the family; three were at home; and four were unknown.

The class of 1911 consisted of 23 members. One

left during the year to go to work and 22 received certificates at the end of the year. In September, 1911, seven returned to the Hancock School, two to the prevocational school, and three went to the trade school; nine had found work during the summer; and one was at home on account of trouble with her eyes. In June, 1912, twelve were working; one was in a shirt waist factory; one, in an overall factory; one, in a custom tailor's establishment; one, in a shoe factory; one, in a cracker factory; one, in a box factory; one, in a department store; five in candy factories.

Conclusion.

The prevocational class has helped to prolong the school life of the girls but not to the extent of sending many of them on to the public trade school. It had been hoped that a larger number of them would go there. But pupils had been chosen who had little prospect of continuing their education beyond the compulsory school age and such influences as the prevocational class could bring to bear had not yet been entirely adequate in overcoming economic pressure and social standards outside the school. But it has made a beginning in opening up new trade avenues.

The influences of the prevocational work were adequate, however, to make the final sojourn of the girls under a school regime a period of real education rather than mere dull waiting or drifting into blind-alley trades, and to prepare them more efficiently than the best academic class could have done for their first experiences as industrial wage-earners. So long as the law permits girls to go to work between 14 and 16, the school must adjust its instruction to this fact. As an effort to bring about the necessary adjustment the prevocational class should be directed with marked success. It is a sound and hopeful experiment.

For the year 1917-1918, the work of the girls' prevocational class, which has been maintained for nine years, has been enlarged and extended to cover three years, and this industrial course is offered as one of the courses which may be elected by the pupils of the intermediate school—Junior High School. This experiment is endeavoring to further lessen the gap between the grammar schools and the high schools, and to reduce the number of those who are lost to the schools during this period.

It is the inherent right of every child that he shall have, before he leaves school, an insight into the various important industries carried on not only in his own community but in the whole world.

Rosana Hunter.

INDUSTRIAL-ARTS MAGAZINE

Board of Editors

WILSON H. HENDERSON . . . Washington, D. C.
E. J. LAKE . . . Champaign, Ill.
S. J. VAUGHN . . . DeKalb, Ill.

EDITORIAL

TEACHING ART AND DRAWING.

THE "up-to-date art course" as represented by our various publishers, represents a variety of methods and purpose that is probably not equalled by publishers of texts for any other school subject. They vary from instruction on "how to learn to draw" by copying printed exercises to the elaborate and comprehensive plans for the student of art which include enough work to occupy the whole of the school time and enough expensive material to discourage the most generous school board.

Like the proverbial fisherman, the art teacher varies in skill as much as in his tackle and is often successful in the same inverse proportion to his equipment. The secret of successful fishing is to study both fish and tackle and bring a fine discrimination to bear on the adjustment of tackle to fish.

In American communities there are few examples of fine design. It is well to consider the strongest appeal which art can make to the school pupil. Strangely enough many of our strongest professional artists have come from the rural communities. How did they become interested in art? If we may judge from the incentive most evident among art students who come to the city from the country, it is a conviction that they have talent for illustrative drawing. Their conceptions of art and their convictions of their own talents are often based on copies they have made of pictures that have little art value. They have *learned to draw just a little*. That little ability has marked them among their friends as having talent. Fired with ambition, they go to the great city and in spite of very great discouragement they often forge ahead of the city trained pupil and ultimately arrive at a high standard of professional skill and excellence.

As the logical trend of art teaching leads away from illustrative drawing toward structural and applied design, it is well for the art teacher to bear in mind the particular opportunity that illustrative drawing offers. Interest in illustrative art will never die. It is as old as humanity and makes the same strong appeal today that it did to the cave dweller of antiquity.

The well trained art teacher sees about him in the most isolated community, material in abundance for instruction in the conceptions of fine art. Thru drawing he can teach much of the best in constructive and applied design with an appeal that is measured

only by his own ability. Thru drawing he can give new vision to his pupils based upon the fundamental principles of balance and harmony. We quite agree with the assertions of certain educators that "Drawing as a special subject has no place in the school curriculum," and we are inclined to believe that it has rarely been taught seriously enough to warrant the title of a special subject. We do believe that art is a subject that cannot be dropped from the school curriculum and we believe that drawing is necessary to instruction in art.

KEEPING HOME FIRES—A DUTY.

SHORTLY after our entrance into the war a movement was started to train nurses' aids for war service. Six and eight weeks' courses were conducted in all the large cities and thousands of women took the courses, hoping that they would be fitted for active duty with the army. Then they learned that the wounded soldier is to receive as good care as the sick and wounded at home and that only professional nurses would be accepted for this service.

At present there seems to be a similar rush of both men and women who wish to assist in the re-education of the sick and wounded soldier. It is hoped that the government will follow the same policy in regard to this work that it did in the nursing work and accept only the services of professionals. The soldier should not be experimented upon by amateurs, and it is not probable that any person with no training other than that of a six weeks' course, can teach anything that will be of value to a soldier.

To win this war our country must be able to not only inflict more punishment upon the enemy than he can upon us but we must be able to withstand more punishment than he can. This means that we must not waste our efforts. Keeping up our home morale, helping our own local factories, transportation lines, ship yards, etc., conserving food and clothing, buying Liberty Bonds, contributing to the authorized war agencies—these are the duties of those of us at home. Flocking in to Washington, crowding the hotels so that men who must be there cannot find room; traveling unnecessarily, bothering officials with useless correspondence—these only serve to obstruct.

Those who have nothing to do can go to work where they are needed and can put the money earned in Liberty Bonds or Red Cross work, and can thus render a double service. To be sure, this is not spectacular, but if we sincerely wish to be of service the station where we work or the character of the work is of small importance.

If we can keep things at home in such a manner that the man at the front need not come home to straighten out his affairs, if we can keep up our schools, keep our factories going so that he may be supplied with food, clothing and ammunition, we will be of much more service than if we rush to the camps, crowd the street cars nearby so that soldiers

cannot come or go, or crowd the restaurants to such an extent that they can not get a meal.

Let us avoid hysteria, keep our heads and each do the work at hand as well as we can. This is our duty. The soldier is doing his duty and let us do all we can to make this possible for him.

COMING TO EARTH.

IN a recent statement on art by a learned pedagogue, his argument opens with these hypothetical explosives:

1. "There are no principles of art."
2. "There is no field of art."

We are reminded of the philosophical gymnastics which reason the Universe out of existence on the theory that time and matter depend on conception and since conception is not creative of time and matter, they *do not exist*. Such vagaries deserve no attention except that they serve as excuses for inaction or eccentric and ineffective action.

We prefer to come to earth and take material existence for granted. We have abundant evidence of its existence but these evidences interest us more as forms than as evidences.

Art is concerned with evident form and the expression of conception thru form.

To say that "there are no guiding principles" for the expression of conception thru form is to deny that organized form has effect. To say "there is no field of art" is to say that conception has no purpose.

Our art instruction needs nothing more at present than expression of clear conception in form. A large vocabulary is not needed to express clear conception. We need definite purpose and the determination to perform that purpose.

Art instruction should develop the ability to design effective combinations of simple forms to serve a definite purpose. This is a field of Art that needs development. Principles do underlie such design. In place of no field of Art we believe there are numerous and definite fields of which this is one. In place of no principles we believe there are well defined principles of balance and harmony that can be impressed and will serve a definite purpose.

MAKING THE MOST OF WAR'S DEMANDS.

A GLANCE at the current educational literature reveals how thoroly the thought and practice of the schools have been modified by the war. While there are conditions necessitated by the war that are injurious to schools' best interests, nevertheless, there are numerous ways in which the schools may gain large and lasting profit from the catastrophe of war.

The school people are realizing as never before the incalculable service which the schools may render to any cause when once their organized machinery is set in motion in the proper direction by the proper spirit. Perhaps one of the most important gains is the matter of self-discovery—the realization that

schools are a powerful instrument even in the grim business of war.

Another important item is the influence on the spirit of the school of the real problems which the war needs have set for the schools to solve. No longer need the school be a place for listless, artificial make-believe. If accepted in the right spirit, the tasks now expected of the schools become the vitalizers, the invigorating stimulus that will make the school over so that it will meet the needs during the present crisis and be prepared and ready for the great tasks of reconstruction at the close of the conflict.

It is no idle boast that participation in Red Cross, Y. M. C. A., K. C., Liberty Loan, Thrift Stamp, Food Production and Conservation, and other similar work is the essence of training for citizenship in a democracy. Such enterprises hold in themselves the essence of practically all of the attributes which the schools have for generations hoped to give thru education. The exigencies, therefore, of a terrible war have brought into the schools a vast quantity of material which the schools are in duty bound to make use of. Furthermore, such material will so enrich and vitalize the work of the school and so modify the methods of procedure as to render the school a more efficient institution after the war than it was before.

The schools that for all these years have been coining such slogans and mottoes as "The needs of society are the problems of the school," should embrace the opportunities now presented and devote themselves to the numerous activities that constitute the needs of the hour.

PLACING REQUISITIONS.

THE federal government is urging people to place orders for coal as early as possible. The buying of fuel is just one phase of the general problem of obtaining supplies of all kinds for conducting the work of the nation during the coming fall and winter.

With the national and international shortage in all forms of products, much argument should not be necessary to convince heads of manual arts and drawing departments of the urgency of making early requisitions for the furniture, tools and materials which they will require during the school year 1918-1919. There will be no overproduction of goods available for school use. Manufacturers have been called, in many ways, to contribute to the winning of the war and there is a shortage of labor which is constantly becoming more serious.

Heads of departments and teachers are, therefore, urged to place their requisitions with school boards as early as possible. The schools should open on time in September and should be equipped with at least the necessities. It is vital that orders be placed promptly to enable manufacturers to produce advantageously and to permit them to make shipments without interfering with national needs late in August.

A NEW KIND OF GRADUATION PROGRAM

Wm. A. Carter, Public School 90, Richmond Hill, New York City



IN 1909 and 1910, when our school was first opened, there was quite an undercurrent of opposition on the part of the parents of the neighborhood to the fact that their sons had to take shopwork and their daughters cooking. As the community, at that time, was more or less of a silk stocking one the parents did not think it proper that their sons be taught to be "carpenters" or their daughters "cooks." With a view to overcoming this opposition, to give a demonstration of the value of shop and domestic science training, and to break the monotony of programs of a literary character (You know the kind, killing poor Caesar—pulling Shylock's whiskers—overworking the Village Blacksmith or riding Paul Revere to death, etc.), the writer suggested a program that would use the manual and domestic science training as the theme. Then, after much argument to convince the principal of the school of the possibilities and feasibility of such a scheme, I was given permission to try it "just once." The program proved to be so successful and enjoyed such a response from those present that we have used this type of program several times since. The program was organized as follows:

An assembly drawing and a drawing of each part of a simple footstool, like the accompanying sketch, was made by the writer. Next a level-headed, responsible boy was chosen to act as foreman. The drawings were then discussed with the foreman until he was sure that he knew just what was needed and just how each piece was to be made.

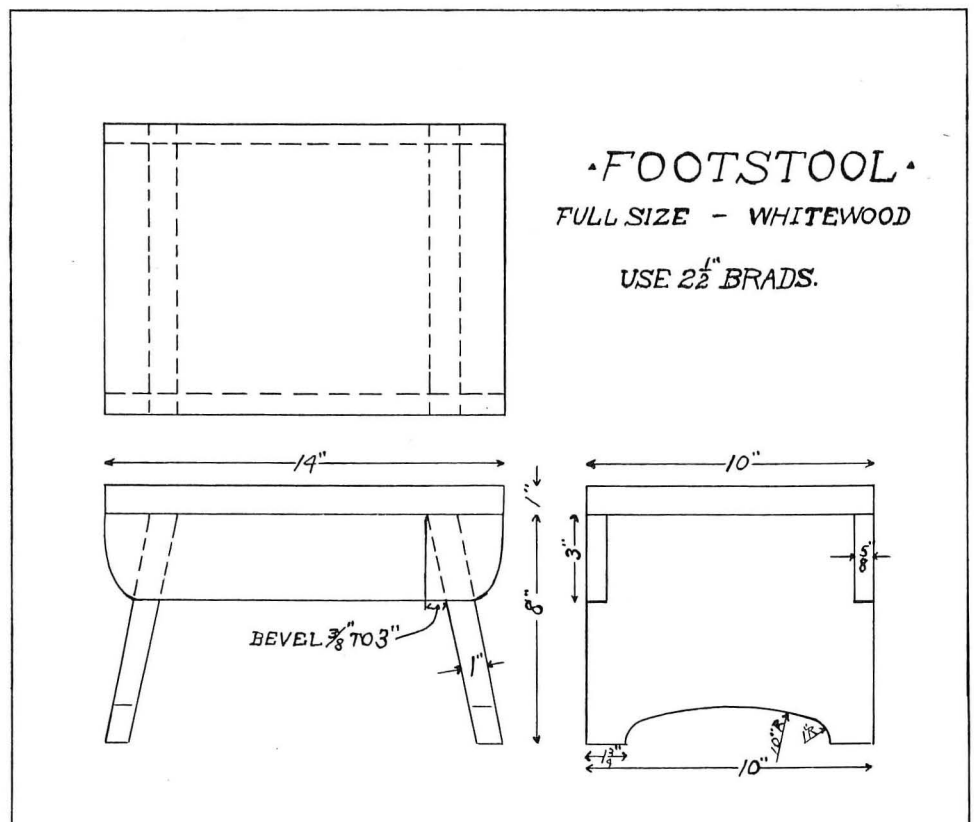
The day the exercises were to be held the boys of the graduating class were called together and it was explained to them that some or all of them (there were about 75 in the class) would be called upon to do some of the work that had to be done on the job that was to be made before the assembly. The boys were cautioned to be on the alert to see what was going on so that they could jump in at any minute and continue the work. They were also cautioned to look carefully not only at the work that had been done

but also at the detail and assembly drawings and finally, if they were uncertain, to consult the foreman. His job was to keep the others going and to watch for mistakes. The foreman was on the platform all during the working out of the project. This was all the instruction or rehearsing that was given to the boys in preparation for the exercises.

Two double benches with full shop equipment were placed on the auditorium platform and turned so that the arrangement of the tools inside the benches and the work to be done by the boys was fully visible from the auditorium chairs. A $\frac{5}{8}$ " board for the stock for the braces and a $\frac{7}{8}$ " board for the stock for the legs and top of stool were placed on top of one of the benches.

After the singing of the opening hymn and the invocation the principal said a few words in explanation of the program of the evening and then asked our superintendent, who was present, to call the names of any four boys, the names of the boys of the class being printed on the back of the program, and every three or four minutes thereafter to call off the names of four more until the stool was finished. The idea of this arrangement was to have as many boys as possible work on the project and at the same time to show those present that the boys had not been trained to do only one particular part of the work.

The foreman took his place, four names were



Details of Foot Stool made at a Graduation arranged by the Author.

read and amidst a shout of laughter from those present the job was started. The first four, naturally, were nervous and floundered around without doing much work, then the next four were called and by this time the nervousness had begun to wear off, and the audience had become quiet and deeply interested in what the boys were doing. Team after team of four went up and relieved the previous four; shavings flew fast, saws ripped and soon the boards began to take shape. In 27 minutes from the time the first four were called the job was completed. From sawing out the stock to surfacing, sanding and nailing together the job was complete and 32 boys had done some part of the work. Then came the second part of the program:

The benches were removed, the platform was swept and a dining-room table, a kitchen table and a gas stove were placed on the platform. The gas stove was attached to a wall light by means of a gas tube. A basket containing table linen, knives, forks, plates, spoons, a bowl and all the necessary materials for making coffee and biscuits were also placed on the platform. The cooking teacher then put a recipe for biscuits upon the table and all was ready for the second act.

The superintendent, as before, was asked to call the names of four girls. The girls worked in relays as the boys had done except that the two girls who started the mixing of the batter for the biscuits were allowed to finish that part of the work before they returned to their seats. First the materials for mixing the biscuit dough were sorted out, the materials mixed and put into the oven. The water for the coffee was put on to boil, the table set, chairs arranged and everything fixed so that by the time the biscuits were baked, in about twenty minutes, everything was in shape to serve the meal. In less than half an hour from the time that the materials

were put on the platform the task was completed and about twenty girls had helped to do the work.

Our program proved to be a tremendous success. From that night on we never had any complaints about the pupils taking their shop or domestic science work. In one night we won the parents over. From being opposed to the work the parents of the community became actively interested and the parents did what they could to have the work extended to other schools of the vicinity.

We have given programs like the above several times since. Twice we have repeated the combination cooking and shopwork scheme. At another time we used the sewing work as the theme and at still another time we gave an exhibit of first-aid-to-the-injured and nursing as part of a program. This scheme has also been used in other schools under our superintendent and has always seemed to prove interesting and instructive.

If a school is looking for something different but something worth while in the way of a graduation exercise it may find the scheme described above worth trying. The plan does not require a great amount of rehearsing or preparation; it is something that the pupils have been doing in their regular school work; and, last but not least, such a program properly rendered will cause the parents of the pupils to have a greater interest in and a greater respect for the industrial work of the school.

In conclusion a word of caution may not be amiss. The big thing to guard against in arranging a program of this nature is that there must not be periods of inactivity during which the audience will lose interest. *There must be something doing every minute.* Choose a problem that can be completed in a half hour, one that will keep the pupils busily at work and that will keep the audience interested until the task undertaken is completed.

KEEP BEES AND SAVE SUGAR

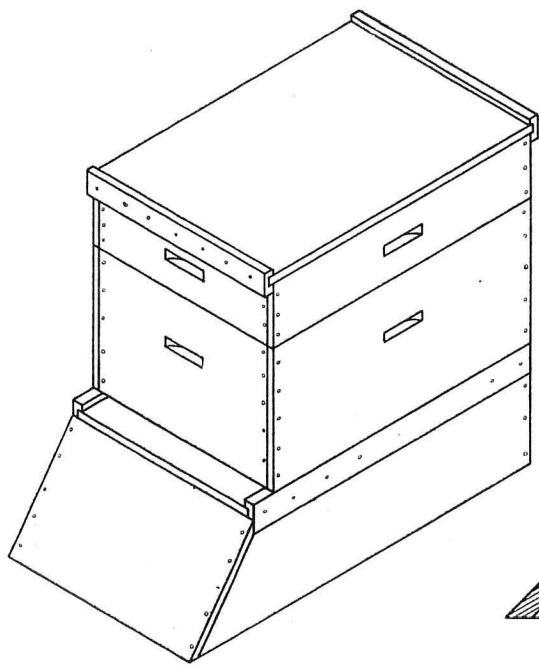
Earl D. Hay, Instructor in Industrial Department,
Oshkosh Normal School, Oshkosh, Wis.



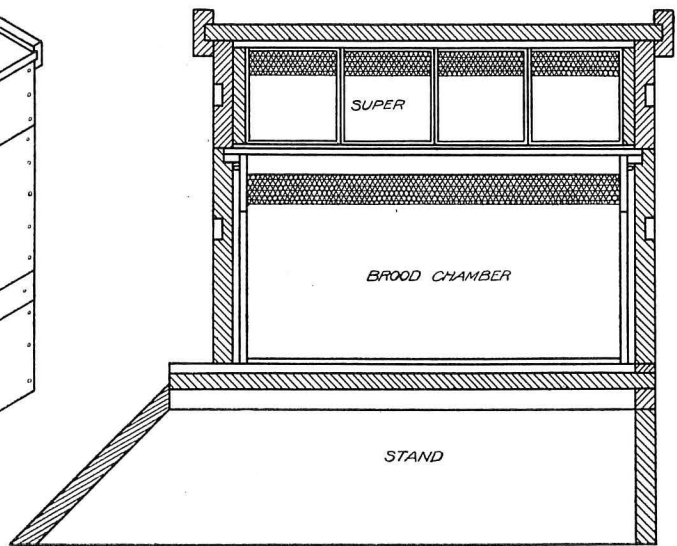
MOST boys like to study Burroughs' "Birds and Bees." For myself, I never could quite make up my mind which part I liked best, the part about the birds or the part about the bees. After reading the book both received considerable attention experimentally and otherwise. For a number of years now we have been cultivating an interest in birds in the manual training department of our schools thru the building of bird houses of every variety and description. Some houses the birds liked and some they did not, but all aided in cultivating an interest on the part of the builders in the birds and their habits. So far the bee has been neglected, altho it is equally as important as the birds and is just as interesting to study, if not more so.

To the average person bee and sting are almost synonymous words. This is all due to a lack of knowledge and is probably due to the fact that the average grown-up's grandfather kept a "stand" of black bees which did sting like the mischief and the only way one could get any honey from them was to make a night raid and "gas" them with brimstone. No self-respecting beekeeper of today would think of keeping such bees. He would have the large, gentle Italians or **none**, as they are superior to the black bees in every way and, what is very important to the novice, they are gentle and easy to handle.

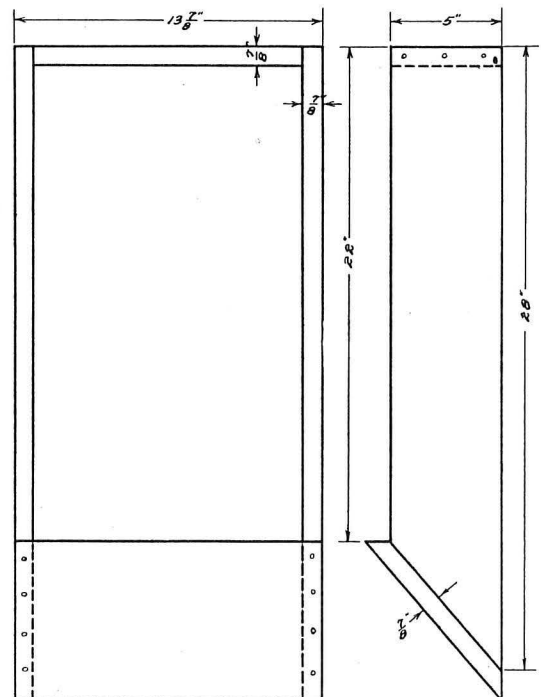
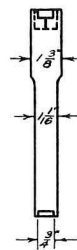
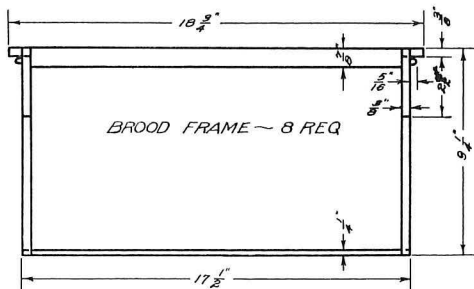
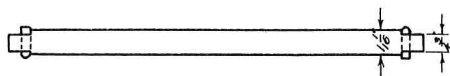
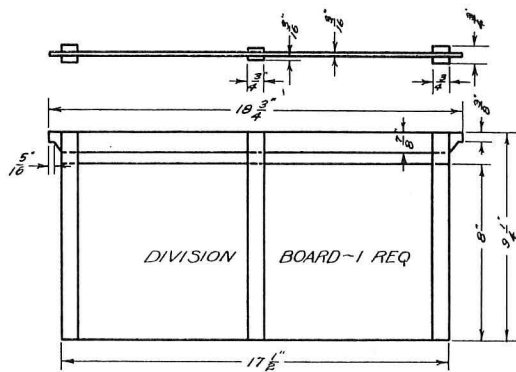
After a boy has built a bird house his interest in birds gradually dies out, to a large extent, altho in the meantime he has learned a great many valuable things about birds under the stimulus of the project.



BEEHIVE AND STAND

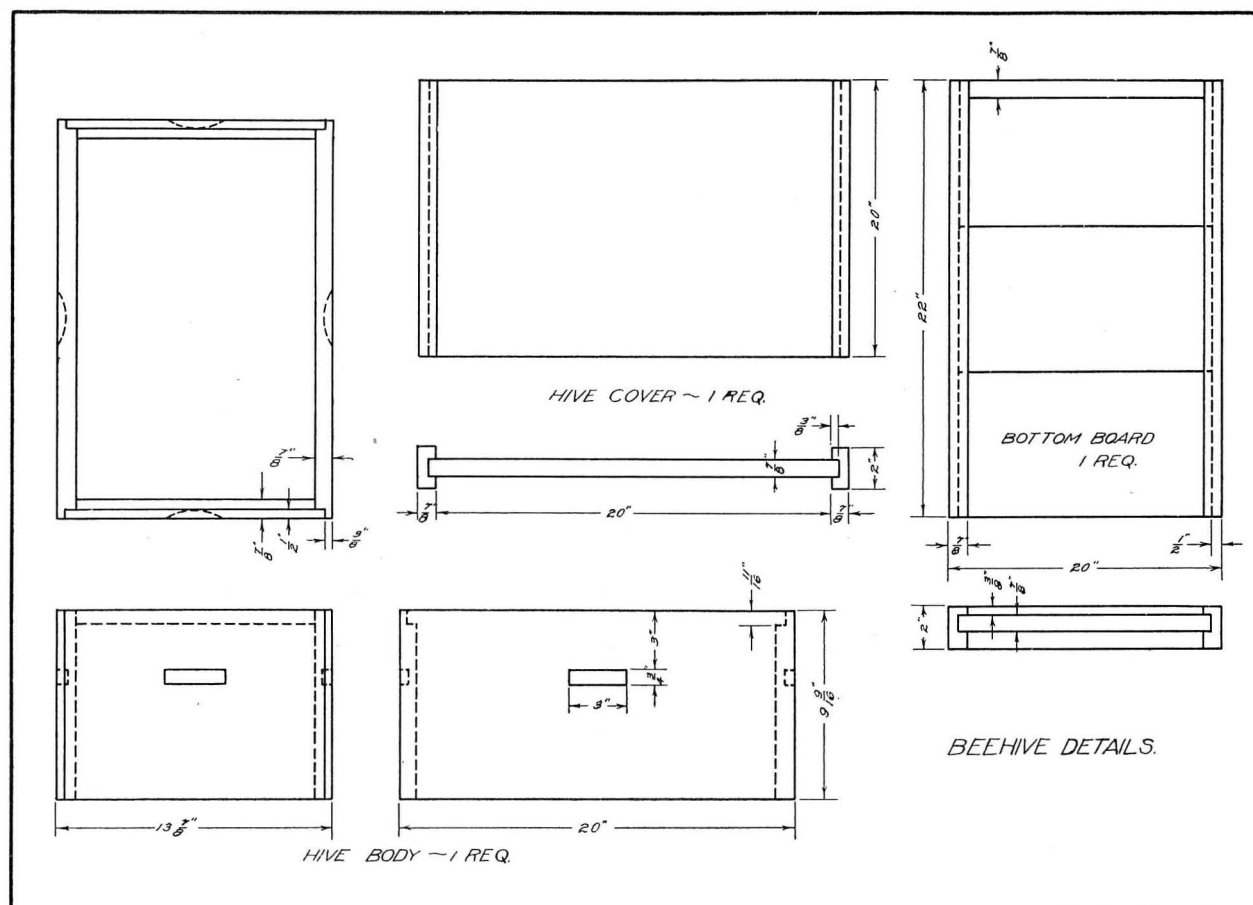
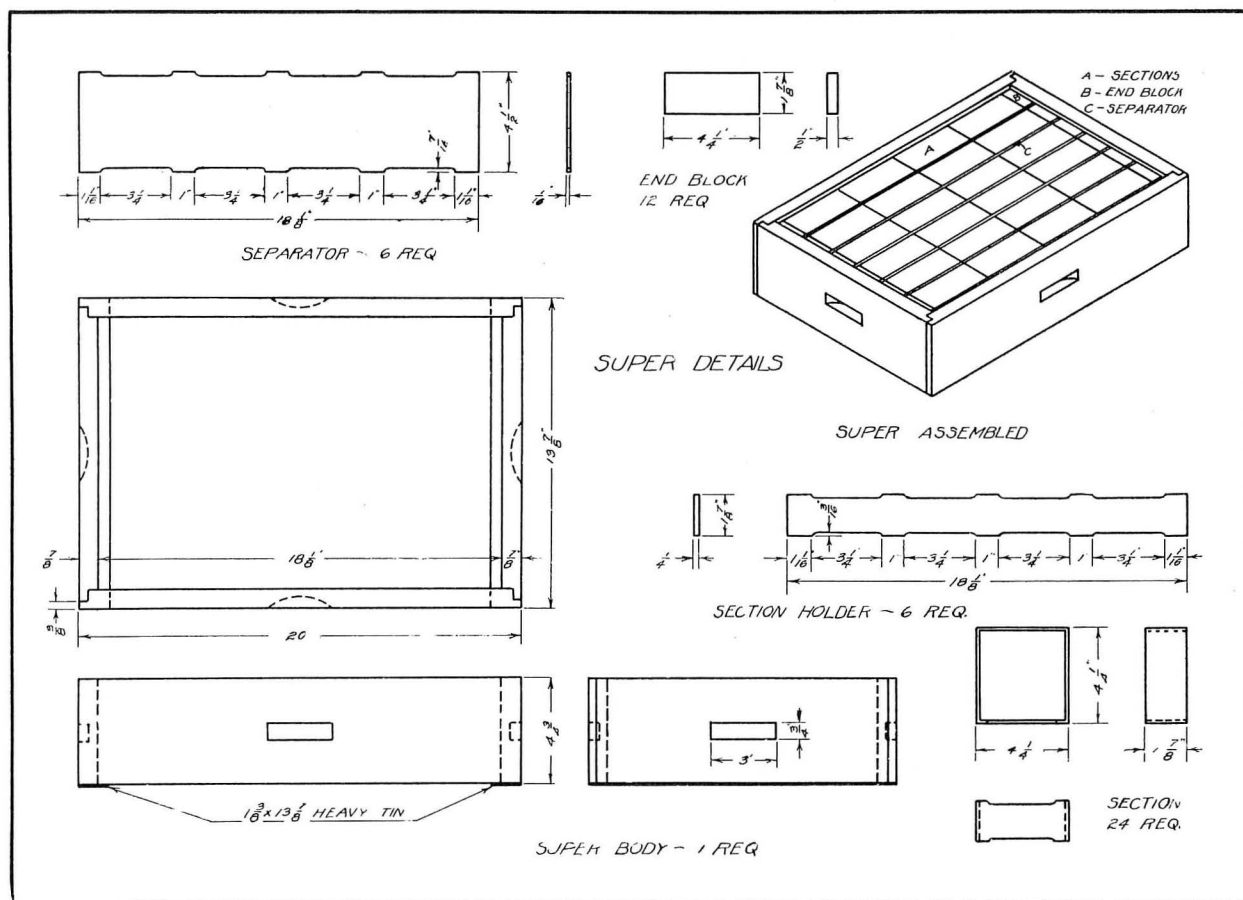


LONGITUDINAL SECTION OF HIVE ON STAND



HIVE STAND ~ 1 REQ.

BEEHIVE DETAILS



DETAILS OF STANDARD BEEHIVE SUITABLE FOR MANUFACTURE IN MANUAL TRAINING SHOPS.

With bees the building of the hive is just a beginning and the interest increases as the days, yes, as the years, go by.

The government also is very anxious that the people of the United States should become interested in bees this year from the standpoint of conserving the sugar supply by harvesting a large crop of honey which will be lost if not gathered by the bees. It is estimated that thousands of tons of honey are lost every year because there are not enough bees to harvest all of the nectar. The bee journals contain urgent requests from the government to the keepers of bees that the honey crop be as well taken care of as possible with the bees on hand and special arrangements are made for those who have bees that are in danger of starving before the honey gathering season whereby they may get the sugar necessary to feed them.

There are very few localities in the United States where a few colonies of bees may not be kept profitably. It is now an established fact that a few colonies may be kept with profit in the heart of a large city, as they gather much nectar from the flowers in the parks and on the lawns.

Now this is the place where the manual training teacher can get in a patriotic punch. Let the teachers themselves pick up information about bees to go with their knowledge of birds and then pass it along to their pupils. Incidentally they will find a bee hive makes a fine project for a manual training course and one well within the ability of an eighth grade or high school boy.

The accompanying drawings give the details of a good type of modern hive. It is a standard size eight-frame hive and so can be used interchangeably with parts of a standard hive bought from the bee-

keepers' supply houses. The sectional view shows the hive set up and containing the comb starters of beeswax which are necessary to induce the bees to place their combs where we want them to place them. The starters are cut from sheets of foundation which, with the sections, are purchased in the flat from the beekeepers' supply houses.

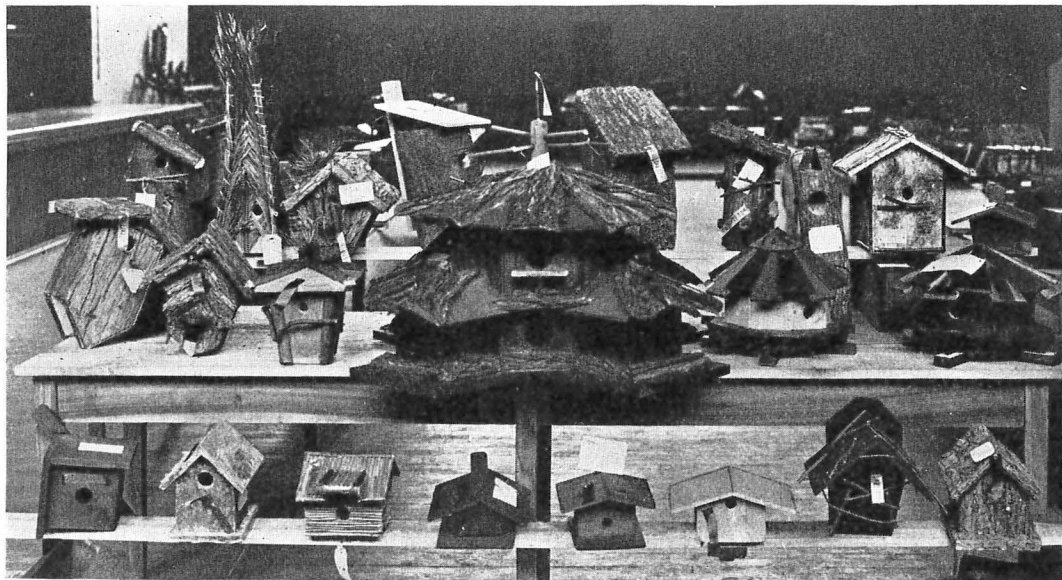
The best material for hives is pine, altho any wood may be used. As the hive is placed out of doors it should receive two coats of white paint on the outside. The inside must not be painted or shellaced, but is left unfinished.

The bees can be purchased by the pound, in nuclei, or in full colonies, from breeders of bees who advertise in the farm and bee journals. The best time to purchase bees depends upon the locality and the way in which they are shipped. These things are explained at length in the catalogs of those who have them for sale. Those who live near someone who keeps bees can usually have a swarm put in the new hive at a very small outlay in May or June.

While the hives are being built the teacher and pupils should secure books on bees and beekeeping from the nearest library and study these interesting creatures about whom volumes have been written and by the time the hives are completed they will know how to buy the bees and take care of them when they get them.

Under average conditions a colony of bees will pay for itself in honey the first year, and in good years will pay for itself twice over.

The keeper of bees will not only be doing a patriotic thing but will find a great deal of satisfaction in supplying his family with an abundance of honey, to say nothing of the pleasure the study of these insects affords.



PRIZE WINNING BIRDHOUSES, SECOND ANNUAL BIRDHOUSE CONTEST, ROCHESTER, N. Y.

More than two hundred birdhouses were displayed by students of the Rochester elementary and high school manual training classes on March 27 on the occasion of the second annual prize birdhouse contest. Ribbons were awarded for the first and second best houses in the various classes and a championship banner was given to the school which had the best all around houses.

The large twelve-family martin house, in the center of the picture, was awarded a first prize and was sold to the president of the Rochester common council for \$25. The pupils of school No. 13, who made the house, used the sum for the purchase of a liberty bond for the school. Mr. Raymond C. Keople supervised the contest and managed the exhibition.

PROBLEMS AND PROJECTS

The Department of Problems and Projects, which is a regular feature of the INDUSTRIAL-ARTS MAGAZINE, aims to present each month a wide variety of class and shop projects in the Industrial Arts.

Readers are invited to submit successful problems and projects. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

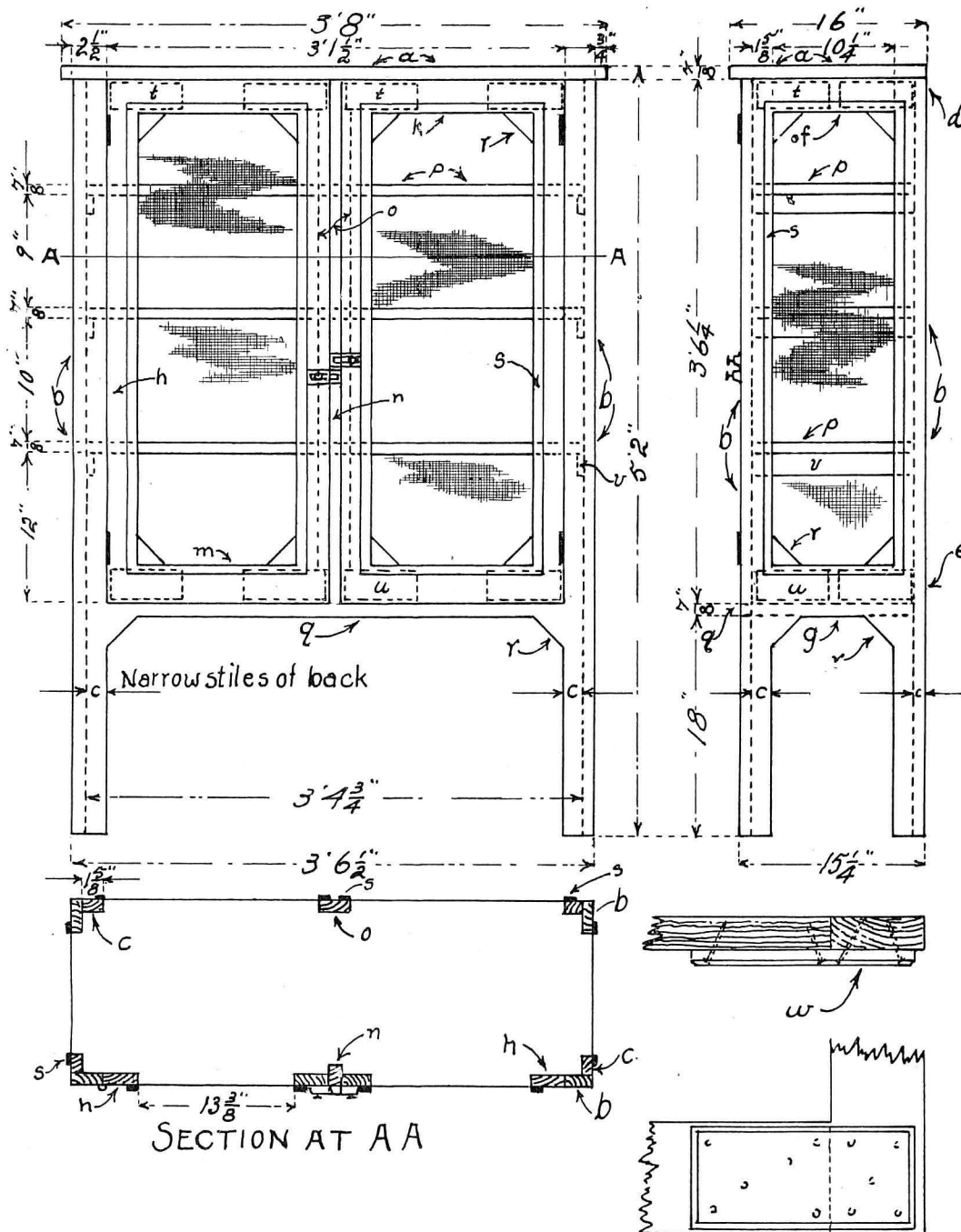
A RURAL SCHOOL PROJECT.

Charles A. King, State Normal School, Plymouth,
New Hampshire.

Among the excellent projects suitable for eighth-grade pupils of a rural school, there can be none more useful nor more worthy of the time expended upon it than a kitchen "safe." The form of construction used is the "fished" butt

joint, which is so simple that anyone who can use the ordinary woodworking tools will have no trouble in making it.

This convenient piece of furniture is open on four sides, wire screening making it fly and mouse proof, and at the same time allowing free circulation of air. A plain or figured muslin curtain on the inside of the doors will make the safe an ornament to the kitchen. On its shelves may be placed



DETAIL OF BACK SIDE
OF LAP JOINT

DETAILS OF KITCHEN SAFE.

hot food for cooling, or food which must be protected from flies and would not naturally be placed in the refrigerator. If the openings are covered with dark cloth the safe makes an excellent place for the storage of preserves and pickles. If kept in a cool cellar it will take the place of a refrigerator except in the hottest weather. The safe from which these dimensions were taken was made of basswood and has been in use for several years, but any soft wood will be satisfactory.

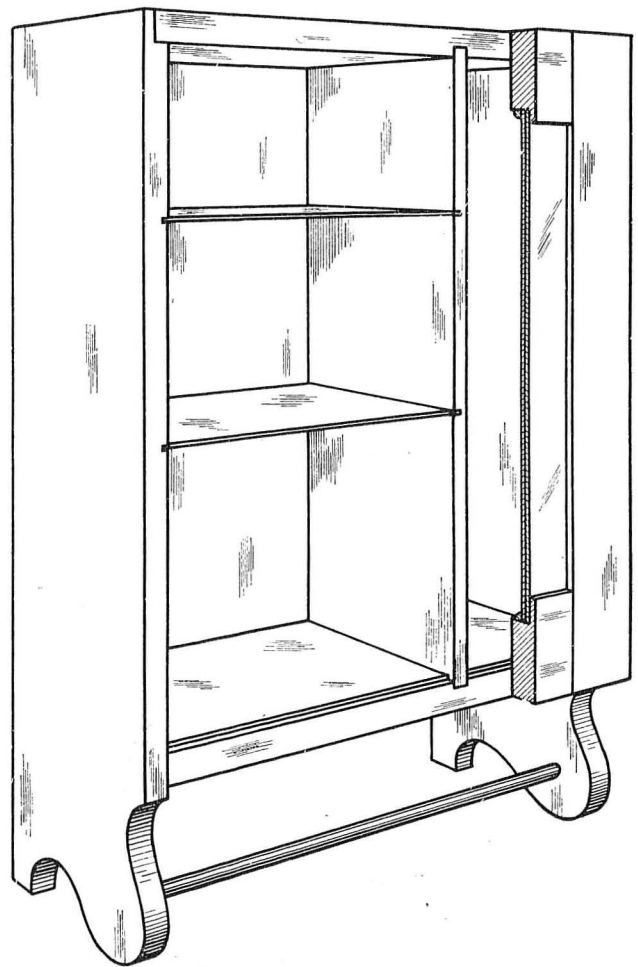
The following list of materials includes all that is necessary in building the safe:

- 1 top, marked "a" in drawing, $\frac{7}{8}$ "x16"x3' 8".
 - 4 front and end back stiles, "b," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x5' 1 $\frac{1}{8}$ ".
 - 4 narrow stiles, front and back, "c," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x5' 1 $\frac{1}{8}$ ".
 - 1 back top rail, "d," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x3' 2 $\frac{1}{2}$ ".
 - 1 back bottom rail, "e," $\frac{7}{8}$ "x3 $\frac{7}{8}$ "x3' 2 $\frac{1}{2}$ ".
 - 2 end top rails, "f," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x10 $\frac{1}{4}$ ".
 - 2 end bottom rails, "g," $\frac{7}{8}$ "x3 $\frac{7}{8}$ "x10 $\frac{1}{4}$ ".
 - 4 door stiles, "h," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x3' 6 $\frac{1}{4}$ ".
 - 2 door top rails, "k," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x13 $\frac{3}{8}$ ".
 - 2 door bottom rails, "m," $\frac{7}{8}$ "x3"x13 $\frac{3}{8}$ ".
 - 1 partition, "n," $\frac{7}{8}$ "x1 $\frac{1}{2}$ "x3' 6 $\frac{1}{4}$ ".
 - 1 back muntin, "o," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x3' 3 $\frac{3}{4}$ ".
 - 3 shelves, "p," $\frac{7}{8}$ "x13 $\frac{1}{2}$ "x3' 4 $\frac{3}{4}$ ".
 - 1 bottom, "q," $\frac{7}{8}$ "x14 $\frac{3}{8}$ "x3' 4 $\frac{3}{4}$ ".
 - 6 lin. ft., "r," $\frac{7}{8}$ "x1 $\frac{3}{4}$ " miter sawed for corner braces.
 - 70 lin. ft., "s," $\frac{3}{16}$ "x $\frac{3}{4}$ ".
 - 12 top lap pieces, "t," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x6". One at bottom of muntin "o."
 - 10 bottom lap pieces, "u," $\frac{7}{8}$ "x2 $\frac{1}{2}$ "x6".
 - 6 shelf cleats, "v," $\frac{1}{2}$ "x1 $\frac{1}{2}$ "x13 $\frac{1}{4}$ ".
 - 1 lb. 3d common nails for lap pieces.
 - 1 lb. 10d finish nails for nailing case together.
 - 1 lb. 8d finish nails for nailing corner pieces.
 - $\frac{1}{2}$ lb. $\frac{5}{8}$ "x No. 17 brads for nailing on screen strips.
 - 1 box 4 oz. tacks for screen wire.
 - 4 3" butts.
 - 2 cupboard catches.
 - 1 4 oz. can of liquid glue.
- Wire screen: Back, 7 lin. ft., 20" wide; doors, 7 lin. ft., 16" wide, or 3 $\frac{1}{2}$ lin. ft., 30" wide; ends, 3 $\frac{1}{2}$ lin. ft., 24" wide.
- In making the case the end and back frames should be nailed together, making a reinforced or fished butt joint as shown in the detail; for the sake of good workmanship the corners of the lap or fish pieces "t" and "u" should be chamfered as shown, and each piece glued and nailed with 3d common nails upon the back sides of the rails, each nail "toe-nailed" or driven in a slanting direction. The pieces should be placed in about the relation with the edges shown in the detail, the end projecting to receive the stile as indicated at "w," and to clear the lap piece of the adjoining frame. The joint edge of each stile should be planed square, or slightly under from the face side to insure a good joint on the face, and the exact place of each rail marked upon it. The joints must be forced together and the lap pieces "t" and "u" glued and nailed to the stiles, or in the case of the back muntin "o" to the top and bottom rails of the back. The lap pieces "u" must be kept high enough to allow the bottom "q" to land below it upon the bottom rails of the back and ends. Care must be used that each frame is square and the corner pieces glued and nailed in their places. The cleats "v" should be nailed in their places at this time.

The lengths of the shelves "p" and of the bottom "q" should be equal to the width of the back frame. Nail the shelves and bottom between the end frames with 10d finish nails, using care that each is of the correct width and so placed that the back will fit into its place between the back stiles of the ends. The front edges of the shelves must be flush with the front edges of the end frames, as the door will stop against them.

Cut the shoulders out of the front edge of the bottom shelf "q" which projects $\frac{3}{8}$ " beyond the edge of the end frames, to receive the stiles, or front casings "b," and nail the latter in their places with 8d finish nails, excepting at the shelves, where 10d finish nails should be used. Place the braces "r" under the bottom and nail the top "a" in its place. If the work has been done accurately the opening for the doors will be square, which will simplify the fitting of the doors.

Make the doors the same as the ends and back, fit and



Medicine Cabinet.

hang them. Do not place the partition "n" until the doors have been fitted, as a thicker piece may be needed, or it may be desirable to move it a little to one side of the center to save planing. Notch it to fit the front edge of the shelves and nail it in place. The hinges may be cut into the edge of the door, or spread flat and screwed upon the face if preferred.

The screen should be stretched tight over the openings and fastened with 4 oz. tacks; the doors should be removed to be screened. Cut the strips "s" to fit the openings and cover the edges of the screen, cutting the corners square or mitering them if preferred, and nail them with $\frac{7}{8}$ " No. 17 brads. Paint or stain, and put on the cupboard catches as the finishing touch.

By setting the legs of the safe in saucers in which some insecticide has been sprinkled it will be ant proof.

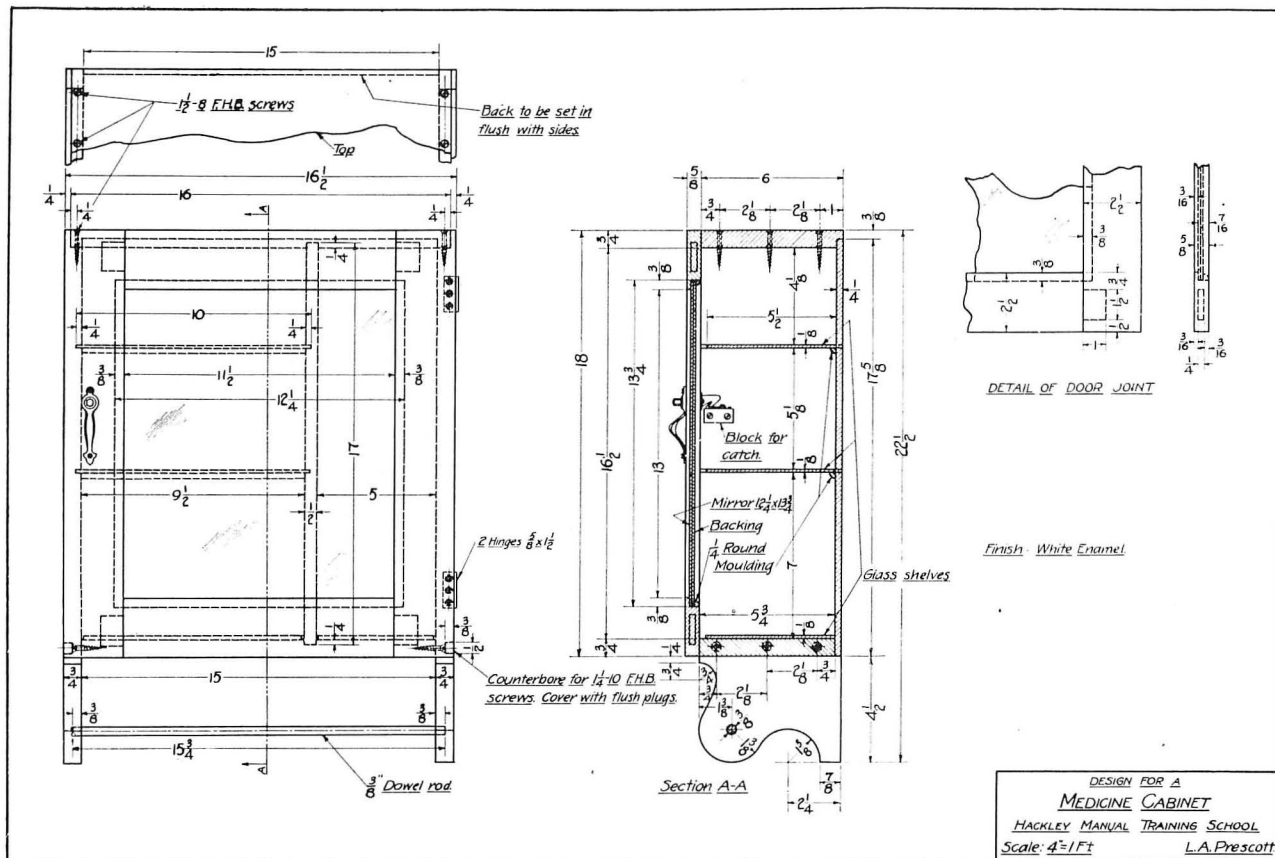
A MEDICINE CABINET.

Le Roy A. Prescott, Hackley Manual Training School,
Muskegon, Mich.

A project which is always sure to be popular with students is that of the medicine cabinet. The simple fact that it is a household necessity makes it very desirable for a shop problem.

The accompanying drawings show the details and a perspective of a medicine cabinet which is practical and easy to make. In the perspective a section of the door is removed in order to show the general arrangement of the interior of the cabinet.

One very desirable feature of the cabinet shown is that of having glass shelves in place of the customary wooden ones. The glass shelves make it a very easy cabinet to clean, as they can be taken out and washed. Medicine which would stick to wooden shelves if accidentally spilled on them can be easily removed from glass shelves, thus eliminating chances of spoiling the interior finish of the cabinet. For the bottom shelf the glass is placed on the bottom of the cabinet, one piece each side of the partition.



DETAILS OF MEDICINE CABINET.

The door can be made with either a mirror or a panel, according to the wish of the student. A $\frac{3}{8}$ " maple dowel rod is put at the bottom of the cabinet to act as a towel holder.

If more than one cabinet is being made in the same class the design of the sides can be changed for the sake of variety.

White enamel is a very good finish for such a cabinet, as it makes it more sanitary. In case such finish is used, the material for making it should be some close grained wood, such as pine or poplar. A good enamel finish is easier to obtain on wood which is close grained than on wood which is not, such as ash, chestnut, etc.

The bill of material which follows is for finished sizes.

Bill of Material.

No.	Pcs.	Name of Piece.	Thickness.	Width.	Length.	Material.
2		Sides	$\frac{3}{4}$ "	6"	22 1/2"	Poplar
1		Top	$\frac{3}{4}$ "	6"	16"	Poplar
1		Bottom	$\frac{3}{4}$ "	5 3/4"	15"	Poplar
1		Partition	$\frac{3}{4}$ "	5 3/4"	17"	Poplar
1		Back	$\frac{1}{4}$ "	15"	17 5/8"	Poplar
2		Door Rails	$\frac{5}{8}$ "	2 1/2"	18"	Poplar
2		Door Rails	$\frac{5}{8}$ "	2 1/2"	13 1/2"	Poplar
1		Towel Rod	$\frac{3}{8}$ " diameter		15 3/4"	Maple
2		Shelves	$\frac{1}{8}$ "	5 1/2"	10"	Glass
1		Shelf	$\frac{1}{8}$ "	5 1/2"	9 3/4"	Glass
1		Shelf	$\frac{1}{8}$ "	5 1/2"	4 3/4"	Glass
1		Mirror		12 1/4"	13 1/4"	Glass

One-quarter round molding as required.

Hardware, screws, etc., as required.

A FOLDING CAMP STOOL.

Ralph F. Windoes, Davenport, Ia.

A project involving wood-turning, pattern-making, and molding is illustrated in the accompanying photograph of a folding camp stool.

The stool itself is a very handy and substantial article, as it folds into such small compass, and is extremely strong.

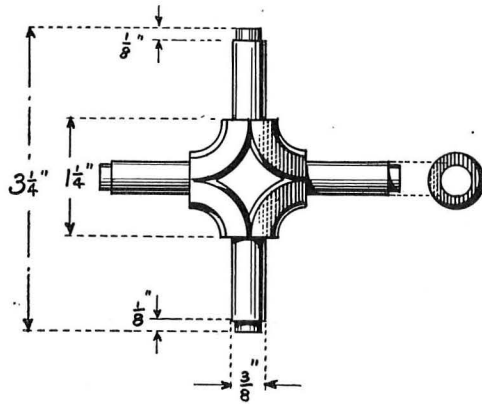
The legs are 24" long, and 1" in diameter, turned as shown or to suit the student. They are hinged to the trunion detailed. This is made of brass and is molded from a pine pattern. The body of the pattern can be formed so



Folding Camp Stool.

as to part on the horizontal center, and the arms turned and doweled in.

The brass casting can be filed smooth, or brought to shape on machines if the school has metal working equipment. Each of the four hubs of the trunnion goes thru one of the



Details of Brass Trunnion.

legs and a washer, shown on the right in the detail drawing, is riveted on to keep the legs in place. The seat is made of two thicknesses of awning cloth with the warp running on opposite directions and bound together around the edges.

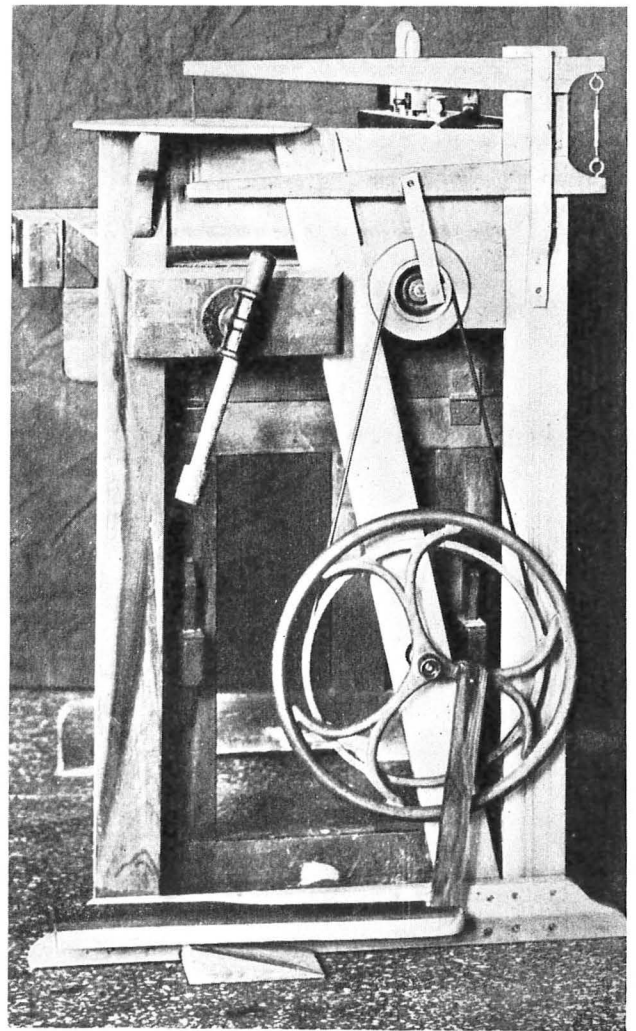
CHECKER RINGS.

Otto K. Wohlers, Clayton, Mo.

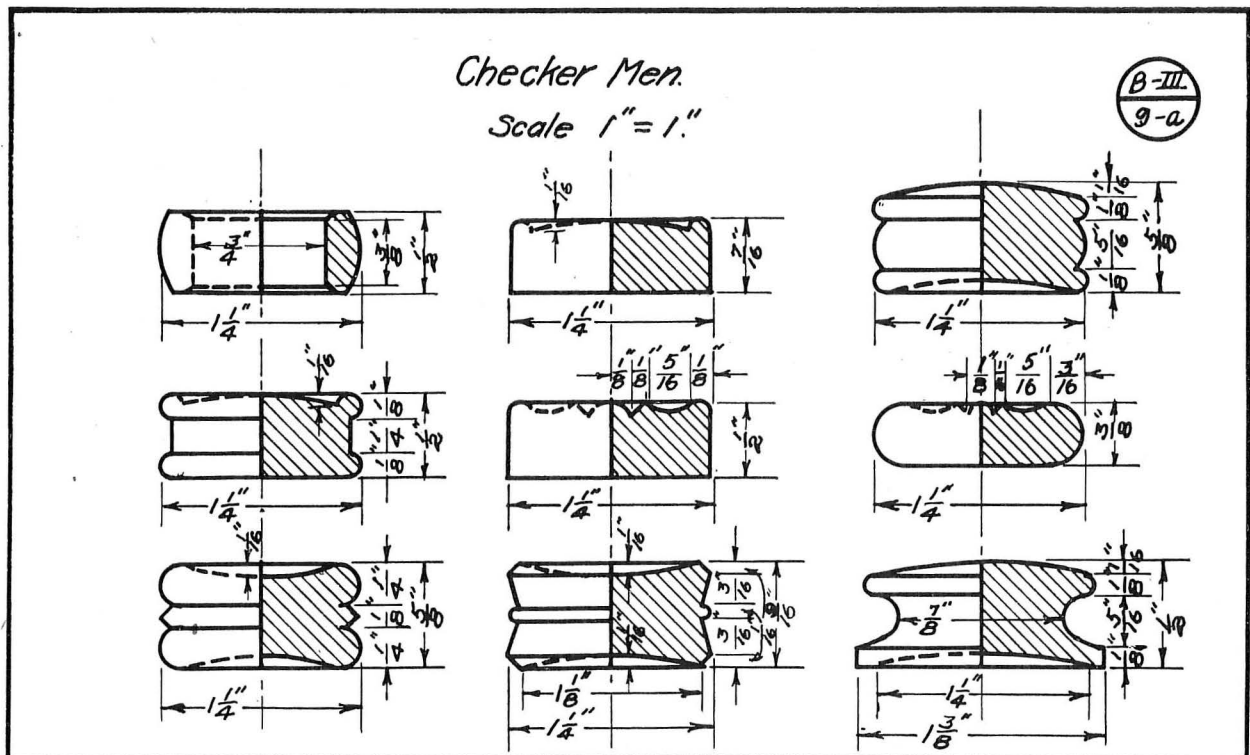
The turning of napkin rings, altho a very good problem, has been criticised from the standpoint that they do not harmonize with other table utensils which are usually of glass or metal.

Checker rings form a good substitute for these, as they are useful, as well as bringing in the same tool processes as are involved in the making of the napkin rings.

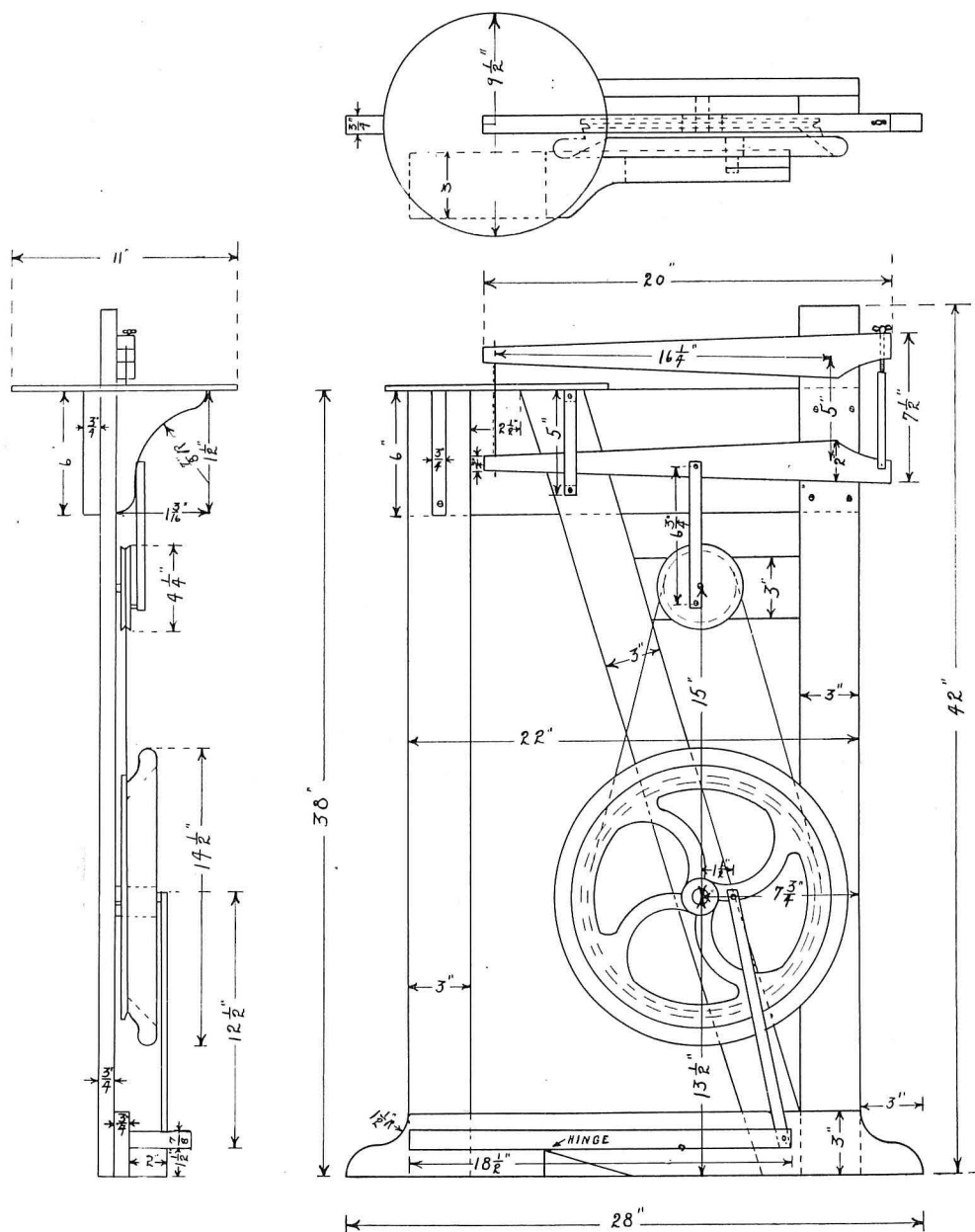
In turning checker rings use a good piece of straight grained hard maple and turn to a cylinder the diameter of the ring. On this lay out a number of checker rings, leaving enough space between each ring so they may be sawed apart or cut apart while in the lathe. Do not make too many on the same spindle, as it is apt to vibrate while cutting the design on the rings especially if the spindle is small in diameter.



Jig Saw.



DETAILS OF CHECKER MEN.



DETAILS OF JIG SAW.

When cutting the design be sure that all the rings are the same size, as this will save work later in chucking them while cutting a hole thru the center or cutting the design on the ends.

When the designs have been cut on the spindle, the rings should be properly sanded and polished before cutting apart. They are then ready for chucking so the ends may be properly finished. There should be twelve white and twelve black rings. The latter may be had by staining with a suitable stain. Where the wood can be had, boxwood and ebony work out very nicely finished in the natural, as both take a very high polish.

Make a chuck after all the rings have been finished on the outside, cutting it so that the ring will fit tightly so that about half of it is in the chuck. Press the ring firmly in place and turn the required design on the end, polish and finish. Reverse the ring and work the other end in the same manner. In this way the 24 rings may be turned and finished in a comparatively short time.

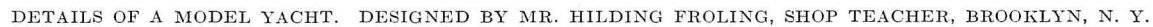
A NEW APPLICATION OF AN OLD IDEA.

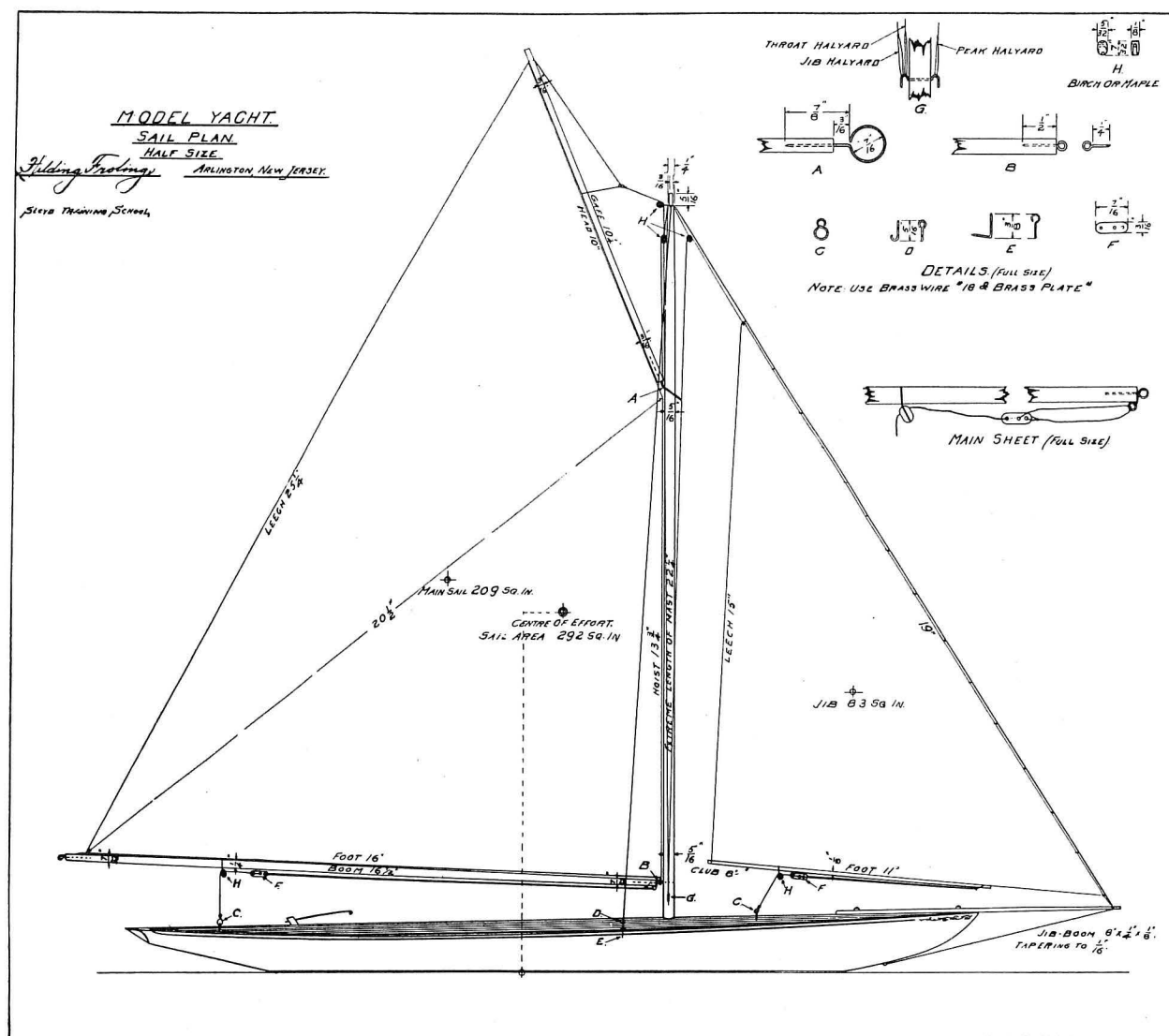
Chas. La Bounty, Manual Training Instructor, West High School, Rochester, N. Y.

Some time ago the pupils in the manual training classes of the public schools of Rochester became very much inter-

ested in the making of thin wood animals for the kindergartens. In the construction of these, most of the boys used hand coping saws but occasionally a lad would bring from home his foot-power saw and in such cases the saw was in use every minute that the teacher would allow it. However, the cheap foot-power saws proved somewhat unsatisfactory and as a result the boys of one class in the West High School were given the problem of working out a jig saw, which would be simple, light, and which could be easily attached to a manual training bench. One of these was built as a sample and worked so satisfactorily that a dozen more have been made for use in the grammar schools of the city. Since the frame is of wood it will not break if it falls. It is easily moved. It is held rigid by placing it in the manual training vise and it occupies no more room than the bench itself. It is extremely simple to make and from the accompanying photograph and drawing any boy of ordinary ability should be able to construct one of these for himself. It will cut wood up to one inch in thickness.

The New York Board of Education has set aside Public School No. 20, at Port Richmond, Staten Island, as a special school for shipyard workers. The school is used two evenings each week by twenty groups of iron and wood workers and more than five hundred men are enrolled.





Sail Plan of Model Yacht. Designed by Mr. Hilding Frothing, Shop Teacher, Brooklyn, N. Y.

WASHINGTON MANUAL ARTS ASSOCIATION.

The Washington Manual Arts Association held its annual meeting on March 23rd at Seattle. Delegates were in attendance from all parts of the state and also from Oregon and British Columbia. President E. G. Anderson was the presiding officer.

Mr. R. W. Moore, who spoke at the close of the business session, took for his subject "The National Society for Vocational Education." He urged that manual arts teachers become members of this national body. Mr. L. L. Summers presented plans for the organization of a Pacific Coast Association for the Promotion of Vocational Education. A committee was appointed to draw up a constitution for presentation at a later session. "Vocational Education in the State" was discussed very completely by Mr. C. R. Frazier, State Director for Washington. Mr. Frazier described the Smith-Hughes Law and explained how schools in the state may qualify for federal aid. Supt. F. B. Cooper, of Seattle, who spoke on "The Junior High School," told of the gradual acceptance of the idea and declared that the junior high has come to stay. He urged especially that the school be housed in a separate structure, entirely independent of the grammar or senior high schools. Mr. Charles R. Scudder, of Bellingham, discussed "Manual Arts in Rural Schools." Mr. Frank C. Vincent, of Bellingham, told of the work the schools were doing in making knitting needles, packing boxes, furniture, checker boards and wooden guns for the Red Cross and for the army camps. Mr. Ben Johnson, Seattle, told of the advantages to be gained from the Smith-Hughes Law by children who leave school to go to work.

He pointed out that in the recent draft there were very few skilled mechanics for the reason that boys in the grades leave school before reaching the high school, and those who do receive instruction in the grades devote so little time to the work that it proves of little vocational value. Mr. F. A. Silcox, federal director of ship construction, discussed the relations of worker and foreman in the shipbuilding trade. He argued for better co-operation and urged that a rational system of "hiring and firing" be worked out by those who have the matter in charge.

At the business session the following officers were elected: President, Ben W. Johnson, Seattle; vice-presidents, George Henry Jensen, Seattle, A. H. Sproul, Portland, Ore., Miss Effie L. Raitt, Seattle, and L. L. Summers, Portland, Ore.; secretary-treasurer, Edward G. Anderson, Seattle, Wash. —Lee A. Juillerat.

INDUSTRIAL ARTS ROUND TABLE.

The Industrial Arts Round Table of Chicago and vicinity held its monthly meeting April 5th at Hullhouse in Chicago. The subject for the evening discussion was industrial work in the elementary school. Mr. Harry Wood, director of manual training for Indianapolis, was present and gave the principal address of the evening, illustrating by slides the work he is doing, emphasizing the productive idea in school work by the use of jigs and improvised machinery and turning out work on a factory basis. The club will visit Mooseheart Vocational School for the next meeting, spending the entire day at the large farm, visiting and discussing the work of that school. —O. M. Merriman.

The Eastern Arts Convention at New Haven

Frederick W. Ried, Director of Practical Arts, State Normal School, Framingham, Mass.

The earnest spirit of the unusual war convention held by the Eastern Arts Association, at New Haven, April 4-6, may well be expressed in the slogan: "America is at war, America must win the war, and the Eastern Arts must do its utmost to help."

The convention opened on Thursday morning, with Mr. Augustus F. Rose in the chair. Dr. Arthur T. Hadley, president of Yale University, in his very hearty address of welcome, pointed out that "we are learning to think of the arts as things for the whole people rather than for a favored few—things that make the whole of life worth living, instead of being an amusement for a few idle hours." "You stand," he said, "for this idea of the relation of art to life. Your association stands for making art a part of the nation's life. Art is needed now more than at any other time for the development of the nation and the home. Over my office is a certain Latin inscription which translated means, 'These men till the soil for all it is worth by the arts.' Let that spirit prevail here."

A stirring and really wonderful address followed the formal speeches of welcome. Mr. F. W. Wright, deputy commissioner of education for Massachusetts, discussed "Schools as Usual or Unusual Schools" and emphasized the fact that now more than at any other time it really devolves upon teachers to see that children are properly trained for the duties of life—the duties which will arise after the cessation of hostilities. "I heard," said Mr. Wright, "Mr. Ratcliffe, the English newspaper man, say, 'Nothing in England is as usual.' When war broke out England closed her schools. One thousand of these were used for mobilizing depots. She realized that the war would not be over in three months as they thought at first and she opened them again. 'Nothing as usual, nothing as before.' I heard a man say that in Europe the war has become a secondary consideration. The social, economic, religious life must go on. The one spirit of the British Empire, 'Never again. We'll finish this dirty job so we'll never be obliged to do it again.' Education with all its discipline and stimulus must be our standby."

Making War Lithographs.

Mr. Wright was followed by Mr. James F. Hopkins, director of art education for the State of Massachusetts, who spoke forcefully on the serious value of art as a factor in training for citizenship.

On Thursday evening the strongest trio of speakers that has ever faced an audience of the Eastern Arts Association was on the platform. Mr. Joseph Pennell, America's foremost black-and-white artist and lithographer, related his experiences in making war lithographs in England and America. "Never was there a period in history with so many things to record," said Mr. Pennell, "and so much history with so many artists to record it." He told of seeing the war in the making and related vividly the teeming life in the aviation fields, in the munitions plants, etc., of England and France. He deplored the fact that there is so little technical art training in America while thousands of art schools are turning out artists in non-technical lines. He advocated schools to teach lithography, etching, wood cutting, and other illustrative processes. He pointed out that these are being perfectly taught in Germany and closed with the thought that in making art practical for the people at last our government has found art a useful asset—not a luxury but a necessity in the war.

The next speaker was Mr. C. Howard Walker, of Boston, who took as his subject, "Conservation of the Individual in Art." "Some artists," he said, "are temperamentally timid and do not reach the highest point of perfection because they are afraid to portray actual things." He attacked commercialism in art and spoke at length on the great cartoons of Raemaekers. Mrs. Honora Willies, managing editor of the *Delineator*, kept her audience deeply interested as she described in vivid word pictures her ideas of the meaning of America and of its ideals. She appealed for the artist that could put the meaning of real America into an illustrative picture, one that would be the incarnation of all the American elements.

The Normal School Lunch.

The College and Normal School Section of the Association held its meeting at a lunch on Thursday noon. Mr. A. C. Boyden, Principal of the Bridgewater Normal School, argued that the key to the success of the drawing supervisor in the public schools is the efficient grade teacher. He argued that the minimum essentials for training teachers in art are: a. Technique sufficient to carry out successfully the directions of the supervisor; b. Blackboard sketching for specific illustrative purposes; c. Methods of correlating drawing and sketching with other studies in the curriculum; d. A pedagogical study

of the course of study which the graduates will meet in their work. e. A proportionate share of practice teaching in drawing under the direct supervision of the teacher of drawing in the normal school. f. It is of vital importance that a prospective teacher be exposed for two years or more in the normal school to teaching which infuses the spirit of art appreciation into every drawing exercise.

Miss Annette Warner, of Cornell University, discussed "Esthetic Appreciation Thru a Minimum Course in Drawing." Arthur W. Dow, of Teachers College, followed with a paper on "Fundamental Principles of a Minimum Course in Drawing." "Art," said Mr. Dow, "has been neglected in the old civilization which is passing. Art will find its true place in the new order. Other nations are carrying on art work as usual and finding a place for the art teacher in the service of the nation. If we can read a nation's character and history in its art what have we as a pure American art? * * * I make no distinction between fine arts and industrial arts. Anything is fine art which involves choice and arrangement. * * * The art teacher has a large part in the rehabilitation of crippled soldiers. I have a list of 22 occupations which can be taught in hospitals."

The New Jersey members of the association also met on Thursday noon at a special lunch which was presided over by Mr. Hugo Froehlich, of Newark. The speakers included: Fred Reagle, director of industrial art, Montclair, N. J.; W. R. Ward, director of manual arts, Trenton, N. J.; Frank Fredericks, Trenton; George C. Greener, of Boston; E. G. Traua, Trenton; Dr. E. B. Kent, Jersey City; E. A. Reuther, assistant industrial commissioner of New Jersey.

Agricultural Arts.

On Friday morning the agricultural arts were, for the first time, definitely recognized by the association. The School Garden Section, which met under the leadership of Mr. George L. Farley, discussed the war problems of school gardening.

Mr. A. J. Brundage, State Club Leader of Connecticut, outlined and explained the work now being done to promote the keeping of home gardens by the children in the state. He traced the movement from the time when a simple corn raising contest was the only agricultural activity of this sort, until at present it is a state wide movement, and is conducted along very definite lines. The boys and girls that go in for home gardening are made members of the Junior Food Army as soon as they have started active work on their gardens. Clubs have been organized and local dealers appointed to supervise the work. The play side of the question is given considerable attention. Parades are to be held in which agricultural displays will play a prominent part and at all the fairs, including the state fair at Berlin, the products of the boys and girls will be placed on exhibition and those clubs that have demonstrating teams will be permitted to enter them in competition with the others. To the boys and girls having the best results, prizes of short term courses at the state college are to be awarded.

Poster Art.

Mr. C. Matlack Price was the first speaker in the Art Section on Friday morning. He discussed the poster art and brought out very forcibly the present opportunity of teaching poster designing in view of the effectiveness of the poster in promoting war work. Mr. Hayward Campbell, art director of *Vogue*, spoke on the process of reproducing posters. He said: "After fifteen years' experience in industrial arts I have come to this conclusion, the more the artist concerns himself with production instead of reproduction, the better his work will be. One hour in the press room with the man in the greasy overalls will teach more than all the splutterings of an art director. It is a wonder to me so many people see the world as stock formula." Mr. R. L. Foster, a prominent art lithographer, and Mr. Pennell closed the meeting with technical descriptions of the processes of poster lithography.

Of the five or six lunches which were held on Friday noon, the Inter Club luncheon was perhaps the largest. Mr. Arthur D. Dean, of Columbia University, discussed the inroads which the war is making on the teaching profession and the numerous changes which are coming into effect in educational practice. Other speakers at this luncheon included: George Morris, vice-president of the Boston Manual Training Club; William Anderson, of the Rhode Island Association of Arts; Miss Frances Bachelder, of the Connecticut Arts Association; E. G. Traua, School Crafts Club of New York; F. F. Ward, Vocational Arts Association of New Jersey, and Miss Martha Hall, of the Boston Manual Arts Club.

In the Household Arts Section on Friday, a considerable number of speakers appeared. The interest centered entirely

on household conservation and the newer forms of teaching which have been made necessary by war conditions. Mr. Frederick W. Ried, of Framingham Normal School, spoke briefly on the subject, "War-Time Handwork for Household Arts Courses and Girls' Clubs." Mr. Ried appealed for a course of handwork based on equal citizenship, giving the girl the same flexibility in the courses as boys now have. The limits of handwork for girls being confined to sewing or craftwork was narrowing and did not develop the "larger minded girl."

Manual Arts Section.

In the Manual Arts Section, on Friday morning, Miss Florence O. Bean, assistant in manual arts, Boston, gave a serious talk on "Lower Grade Manual Training War Activities." Miss Bean has been imitated over and over again in the Eastern states, as she undoubtedly is the pioneer in developing war projects for these grades. They include cardboard vellum bindings and sewing projects. Mr. Edward C. Emerson, assistant director of manual arts, and chairman of the Massachusetts Committee on Manual Training for War Service, told of his experiences on the state committee work and about the conditions entering into the manual training problems of the times. Mr. Alvin E. Dodd, former president of the Eastern Arts Association, came from New York to talk on "Legislative Problems Connected with Industrial Education." Mr. Almond Wentworth, director of art, and Mr. Robert Beebe, of the Boardman Apprentice School, have accomplished some wonderful things.

At the Friday evening session, Col. Anthony Dyer discussed "The War Duty of Artists, Painters, and Literary Men." Prof. Arthur D. Dean spoke on "Occupational Therapy," a subject quite removed from art, but which nevertheless held his audience in spellbound attention. The subject is one, said the speaker, which has been evolved to meet the exigencies of the war. He told of the hospitals in Canada where today these experiments are being carried on among the wounded soldiers who have been returned from the front. In many cases it means the restoration of the mental faculties of men who have suffered from shell shock, or who have been physically injured. It consists of a process whereby, thru occupation, the physiological result is obtained.

"Camouflage" was the subject discussed on Saturday morning at the general session, by Mr. Philip Little, of Salem. Mr. Little sketched as he spoke and outlined the leading systems of camouflage as applied to seagoing vessels. Mr. Douglas C. McMurtrie, director of the Red Cross Institute, New York City, gave an interesting talk on "The Re-education of Crippled Soldiers." Mr. McMurtrie had a large number of slides and moving pictures showing more than words the different methods of re-education and restoration of lost limbs. He showed that there are many things a man can do who has lost arms or limbs and function one hundred per cent. In a long moving picture, Mr. McMurtrie showed that there were various forms of manual training used. Carpentry, carving, drawing, typewriting, etc., are the present forms of manual training which may be used in occupational therapy, even if a different pedagogy must be evolved to get at it. Fundamentally, subjects must be presented in such a way that the individuals may forget self and keep happy at work. Mr. E. E. MacNary, head of the Industrial Training Department of the United States Shipping Board, presented pictures illustrating the present methods in building ships and discussed the general plan of constructional procedure.

The association elected the following officers:

President, Augustus F. Rose, Rhode Island School of Design, Providence, R. I.

Vice-President, Fred P. Reagle, Department of Education, Montclair, N. J.

Treasurer, Almond H. Wentworth, Director of Art, New Haven, Conn.

Chairman of Editorial Board, Miss Florence O. Bean, Department of Manual Arts, Boston, Mass.

POSTER CONTEST COMPLETED.

The National War Savings Poster Contest was ended on May 15 and while reports are incomplete there are indications that the schools of every state have sent thousands of posters to the local juries. The group juries complete their work about May 25 and the final judging by the National jury will take place on Wednesday, June 12. The group juries are as follows:

Eastern States—Mr. C. Edward Newell, chairman, Springfield, Mass.

Southern States—Mr. Elsworth Woodward, chairman, New Orleans, La.

Middle Western States—Miss Emma M. Church, chairman, Chicago, Ill.

Western States—Prof. Arthur B. Clark, chairman, Stanford, Cal.

The National jury will be headed by Mr. Charles Dana Gibson, who is chairman also of the Pictorial Committee of the Government War Publicity Committee. The jury will meet in the galleries of the Art Alliance in New York City, where the posters will be displayed for a week or ten days. It is planned to send them to Washington, where they will be organized by the National War Savings Committee or the American Federation of Art as a traveling show.

WAR WORK OF THE BENTON HARBOR SCHOOLS.

The schools of Benton Harbor, Mich., have been engaged in a variety of activities connected with war relief work for the Red Cross and the army cantonments. In the line of actual class lessons it has been possible to carry out assignments of "Lessons in Community and National Life" in both the grammar grades and high school. Graded lists of war facts have been compiled and added to from day to day by the teachers for use as classwork. The manual training classes have completed eight oak Y. M. C. A. game tables for the Great Lakes Training Station. The household arts department has held exhibitions of war bread and meat substitutes made in the classes, and organized war garden work has been undertaken with an initial enrollment of 150 pupils. Military drill has become a part of the physical training course and is compulsory for all students. The salesmanship class of the high school took as a practical problem the sale of Liberty Bonds which resulted in a total of \$3,000. The economics class undertook an intensive study of war facts and conditions and distributed food conservation cards thruout the city. The high school has ten four-minute speech makers who are available for short addresses before the pupils.

In the several campaigns for funds the schools have also done their share. A five-day campaign for Junior Red Cross memberships resulted in a total of \$667, or a surplus of \$147, and \$500 worth of thrift stamps have been sold thru the encouragement and support given by teachers and principals. The high school thru one of its clubs, at Christmas, collected money and shipped boxes to the sailors and soldiers who went into the service from the high school. Emphasis is placed on attendance at school until called for definite service.

INDEX FOR SHOP LIBRARY.

C. S. Chapman, Stevens Seminary, Glencoe, Minn.

Every manual training teacher who has a more or less complete library of books and magazines has trouble in making the best use of the material because of the difficulty of quickly finding items. Books are more useful because they are indexed but magazines lack topical indexes so that much of the good which they contain is buried.

TABLES			
Library		Working Drawings	Plates
		by F. Holstead	XLIII-XLVI-XLVII
Round		Working Drawings	
Center		by F. Holstead	XLV
Serving		Working Drawings	
		by F. Holstead	XLVIII-XLIX
Dressing		Working Drawings	
		by F. Holstead	L
Dressing	1/'16	Industrial Magazine	Page 6
		(Arts)	
Center	11/'15	Industrial Magazine	Page 221
		(Arts)	
Library	5/'15	Manual Training Mag.	Page 585
Dining	2/'15	Manual Training Mag.	Page 383

Typical Card Used by Mr. Chapman.

A good solution of this difficulty is a card index, arranged according to subjects which will most likely interest students. In the writer's school such a card index has been used with success. Some two hundred cards are kept in a box and each card is carefully headed with some general type of project or process. The cards make it possible for a student to quickly make a selection and, with the help of the instructor, to examine all of the available designs.

The accompanying illustration shows the arrangement of a typical card listing all of the designs for tables available in the library.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for the convenience of subscribers who may have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any question and reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Column Clamps.

794. Q.—Will you please inform me where I can purchase a Noxall column clamp, or similar device for gluing hexagonal taborets or columns?—*G. W. B.*

A.—The clamp mentioned is made by A. A. Loetocher, Dubuque, Ia. Clamps of this and similar types may be had from general dealers in manual training supplies. Consult the Industrial-Arts Index on the inside back cover of the magazine.

Re-education of Disabled Soldiers.

810. Q.—Please tell us of pamphlets or books describing occupational therapy and re-education of crippled soldiers, what the civil service requirements are for teachers in this line of work, when more are needed, etc.—*M. S.*

A.—Complete bibliographies on the subject will be found in the Survey for October 27, 1917, (volume 39, page 96) and in the Review of the U. S. Bureau of Labor Statistics, September, 1917, pages 599-624.

No civil service requirements can be stated because it has not yet been decided whether the education of these men will be in the hands of military or civil authorities. There is at present a contest on between the Surgeon General's Department of the Army and the Federal Board for Vocational Education. Inquiries should be addressed to both at Washington, D. C.

A splendid abstract of recent literature may be found in Bulletin III, of the Office of the Surgeon General, War Department, issued April 15, 1918. It covers especially the experience of France and Great Britain.

Canoe Paddles.

800. Q.—Several of my boys want to make canoe paddles, but spruce stock is not available. Can you suggest something else for this purpose? Would hard pine be suitable?—*R. H.*

A.—Pine, maple, red cedar, ash, or beech may be used.

Flat Antique Finish.

801. Q.—Will you kindly tell me how to put on that perfectly flat antique finish such as is commonly used for finishing old mahogany tables, etc.? I understand that this is a finish that will not scratch or turn white from heat or rough usage.—*M. G. K.*

A.—In answering the inquiry of your correspondent, regarding the perfectly flat antique finish, such as is commonly used for finishing old mahogany tables, I will say that this is produced thru the use of mahogany, lime water, and oil, and may be obtained on this wood alone. In bygone days, time was of little object, with the result that the people of that period could afford to use the following method of finishing their fine old mahogany tables in such a manner as to produce a finish quite proof against wear and tear, hot or cold water, and wines and liquors.

The mahogany is first sponged with a solution of lime water made in the following manner. Take fresh burnt lime, place in a wooden tub or barrel, cover with a small amount of hot water and quickly cover the receptacle with blankets or burlap, in order that the steam produced by the quick lime may thoroly disintegrate the latter and reduce it to powder. When this is complete add a large quantity of water and stir well. After this has settled to a clear liquid it will contain enough lime in solution to be used as a sponging material. Let the wood dry thoroly, sand perfectly smooth and then coat with a very hot solution of one quart raw linseed, one cup of turpentine and one tablespoonful of dark Japan drier. This should be brushed on freely and rubbed into the wood with a piece of clean Brussels carpet. The carpet is washed with soap and hot water after using and may then be reserved for future use.

This treatment should be repeated weekly for a year,

and in some instances where I have observed this result it has been a matter of family pride that this treatment has been kept up for two generations with occasional washings of some suds from some fine soap like Ivory.

After much careful experimental work, I have succeeded in producing this finish thru the use of a solution of one ounce of bichromate of potash to one gallon of water, which is sponged on as is cited for the lime solution. Follow by the drying and sanding. The linseed oil I have replaced with China wood oil or Tung oil in connection with the turpentine and drier. Three treatments one month apart have produced remarkably good results which have compared very favorably in color, resistance and beauty to a table which I endeavored to match and which has been under treatment for over one hundred years. Such a finish as this stands in a class by itself and is not to be compared on the same basis as a varnish finish produced with a high grade heat and water resistant varnish. To my mind good varnish, properly applied and rubbed, gives a much better finish to mahogany than can be produced in any other manner.—*Ralph G. Waring.*

Finishing Turned Work.

804. Q.—I would like to find out about finishing mahogany turned work. I have trouble in trying to stain or fill the work, as it makes the end grain dark. How do they get that even color on the turned work put out in the factories?—*L. R. B.*

A.—Answering the inquiry of your correspondent, regarding the production of even color on turned work, he will find that one of the following methods may be suitable to his work. After all the turnings have been carefully sanded ready to stain, all portions which expose end grain and which because of their porous condition are apt to absorb more color than do other parts, should now be coated with a size prepared in either of the following manners:

To one quart of gasoline add one tablespoonful of raw linseed oil; or to one quart of water add one tablespoonful of powdered dry glue and bring to a boil. Be sure that all glue is in solution. Either of these sizes should be applied with a brush or sponge in such a manner as merely to dampen those portions showing end grain. Before the size is entirely dry the whole piece should be coated with the stain in normal strength. Best results are obtained thru the use of water stains but in case an oil stain is used, use the gasoline formula.

In the factory this work is given to the most careful and intelligent man the finishing force contains. It is work which requires much careful judgment in order to produce the even results which your correspondent has noticed on commercial work. It is my suggestion that he practice this work on a large number of turnings in order that he may "get his hand in," as the saying is, before attempting to do this on a standard piece.—*Ralph G. Waring.*

Dowel Cutter.

780. Q.—Do you know of any machine similar to a pencil sharpener that could be used to make eight hundred knitting needles?

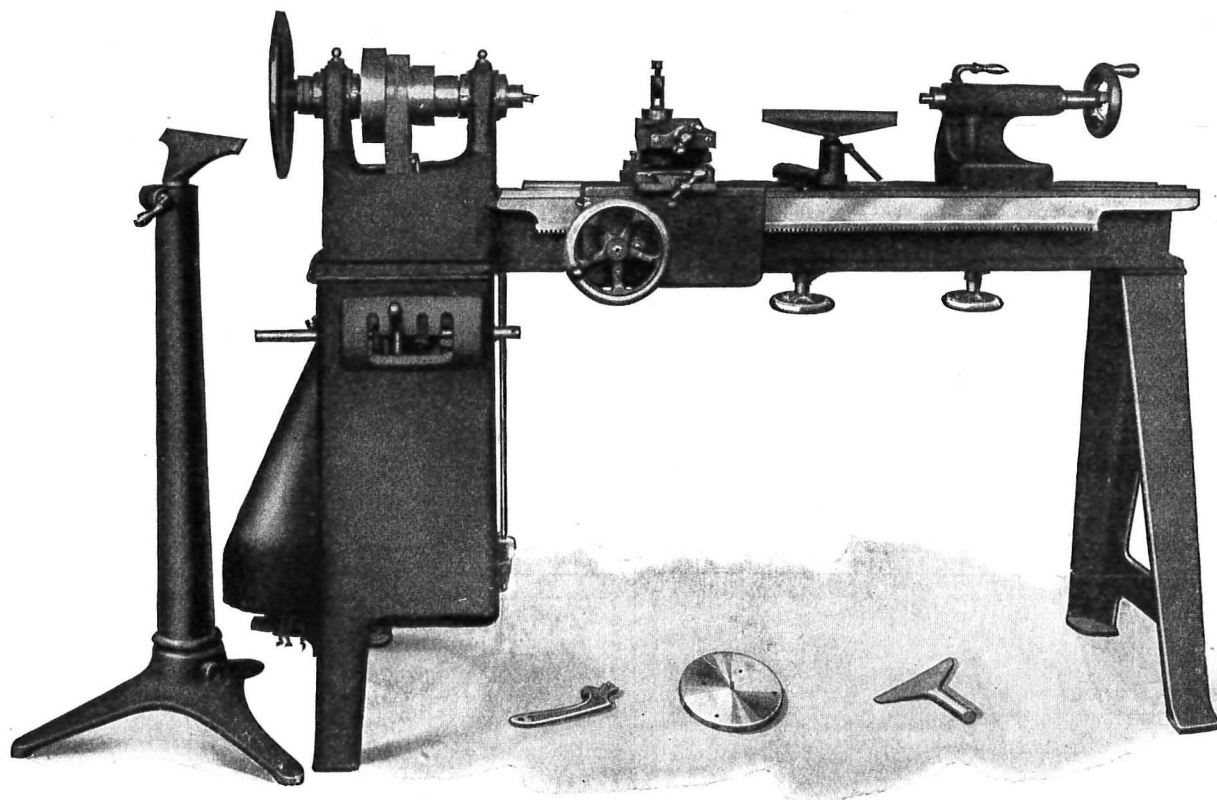
A.—Stanley dowel and rod cutter made by Stanley Rule & Level Co., New Britain, Conn.

INDUSTRIAL-ARTS MAGAZINE INDEXED.

The Industrial-Arts Magazine is indexed regularly and cumulatively in the Readers Guide, which is published monthly and annually by the H. W. Wilson Company, 958 University Ave., New York, N. Y. The guide lists new books and literature from month to month and the annual number spreads before the reader a complete bird's eye view of the year's doings and sayings in the leading periodicals.

"WELLS" MANUAL No. 218 TRAINING LATHE

Demonstration Model



ONE OF THE "WELLS" BIG 4 M. T. LATHES

This No. 218 Lathe is the leader of the clan, the biggest and best of the Big 4 Models. It comes in lengths long enough to take the base ball bats which the boys all want to turn, and too, its Hand Feed Carriage and Compound Swivel Tool Rest enable the instructor to demonstrate any of the more difficult turning operations.

It's the best all around model which an instructor could wish for.

Let us tell you why. New literature ready to mail.

G.T.D.
PRODUCTS
TAPS — DIES
SCREW PLATES
GAGES
REAMERS
PIPE TOOLS
THREADING MACHINES
LATHES
SCREW MACHINES
GRINDERS
CUTTING-OFF MACH.
SAW AND CUTTER
SHARPENERS

Greenfield Tap and Die Corporation
Greenfield, Massachusetts, U.S.A.

MACHINE TOOL DIVISION



CLAMPS AND HAND SCREWS

Have you had trouble in finding the proper clamp for your requirements?

In our 16 page catalog of Hand Screws and Clamps we show a very large variety for every conceivable purpose. We have them of wood, iron and steel, plain and adjustable, rapid acting, etc., for carpenters, wood workers, machinists, etc.

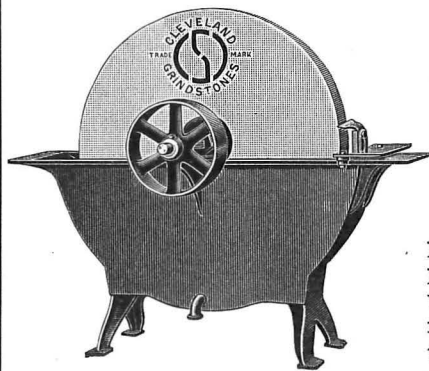
Catalog No. 154 upon request.

HAMMACHER, SCHLEMMER & CO.

Hardware, Tools and Supplies

NEW YORK, Since 1848

4th Ave. and 13th St.



Keystone Grindstones FOR YOUR School

If you expect your pupils to do good work it is also necessary that they have good tools to work with.

These tools must also have cutting edges or the work will not be satisfactory. Our Grindstones keep the tools in first-class condition all the time.

Both foot and power driven. Used in some of the largest Manual Training Schools in the United States.

Write for catalog, also folder
"Selection and Care of a Grindstone"

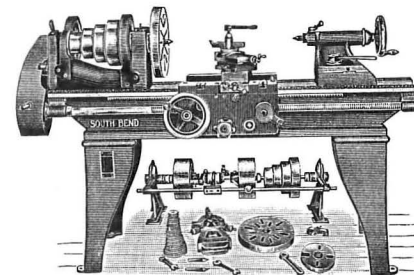
THE CLEVELAND STONE CO.

Union Bldg.

Cleveland, Ohio

South Bend Lathes

Over 15,000 in Use



15 Inch by 6 Foot Engine Lathe

The Most Practical Size for the School Shop

13 inch Lathe, 5 foot Bed	\$272.00
15 " " 6 " "	352.00
16 " " 6 " "	432.00
18 " " 8 " "	566.00

Delivery one week after receipt of order.

60 day approval test in your shop.

HOW TO RUN A LATHE

Revised edition No. 16 of book, "How to Run a Lathe,"

Post paid. No charge to shop instructors.

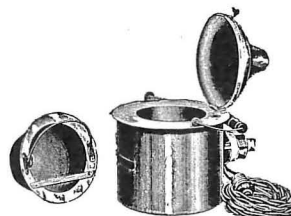
New Catalog No. 50. Free to any address.

South Bend Lathe Works

427 E. Madison Street

South Bend, Ind.

Don't Only Say "Glue Heaters" Insist on International



Why? I'll tell you why. First of all our one quart heater operates on less than one cent per day for current. This naturally effects a considerable saving at the end of the school year. Secondly, the fact that the INTERNATIONAL is built on the fireless cooker plan, absolutely prevents

radiation. No hot steam pipes during hot weather. No leaky valves.

Only the best of workmanship and quality materials used in the construction. No seams. No water bath. No burnouts or burnt glue. Three heats: High—medium—low. In the Manual Training Department where rapid melting is often required, you will find the "INTERNATIONAL" to answer your requirements. Fits any lamp socket.

The INTERNATIONAL is used in hundreds of grade schools and high schools all over the United States, to splendid advantage. Endorsed by leading educators.

If your manual training shop is not equipped with a glue heater, or if the heater you are now using is not satisfactory, be sure to get in touch with us. We can help you. Write for illustrated folder.



INTERNATIONAL ELECTRIC COMPANY

MANUFACTURERS
ELECTRICAL HEATING APPLIANCES

INDIANAPOLIS, U.S.A.

Absolutely

The merit of a product is attested by the demand.
The volume of demand is evidenced by the size of the works.
And when the works, steadily increasing, year after year
attain immense proportions—

THEN is conclusively demonstrated the continued and
absolute confidence of a vast army of users in the
excellence, worth and reliability of the goods.



HENRY DISSTON & SONS, INC.
KEYSTONE SAW, TOOL, STEEL AND FILE WORKS
PHILADELPHIA.



THE LARGEST IN THE WORLD.

NEWS NOTES.

The University of Pittsburgh is one of three state educational institutions of Pennsylvania which will establish a department of vocational training. The new department complies with the provisions of the Smith-Hughes law thru which large appropriations are made for agricultural, industrial and vocational work in state institutions. Teachers from the school will be sent out to the industrial centers in the district, and men from the trades will be selected to receive special training preparatory to taking charge of the novices in those trades.

Vocational training in agriculture, supported jointly by the state and the federal governments, is an established fact in six Iowa schools. The work is in charge of Mr. W. H. Bender, formerly director of agricultural education in the University of Minnesota.

A number of *Pittsburgh social workers* were speakers at the three-day vocational conference which opened at Wooster University, Wooster, O., on March 18th. Miss Esther M. Smith spoke on "New Occupations Open to Women Thru the War;" W. W. Sibray discussed "The Federal Civil Service;" Charles C. Cooper discussed "The Settlement House;" Miss E. Cornelia Giddings spoke on "Lunch Rooms," and Miss Ernestine Rose discussed "Library Work."

A *county vocational school* has been established in Palm Beach County, Florida. A site has been donated for the institution.

Ten students of the evening vocational school of the Massachusetts Charitable Mechanic Association, Boston, in March, were awarded diplomas of graduation.

Vermont is leading the New England states in certain lines of vocational education work. In Barre a granite workers' school has been established and in St. Johnsbury a co-operative system of industrial training has been inaugurated. Junior high school boys in St. Johnsbury operate the sugar orchards and sell the product to the Fairbanks corporation at the market price.

The *State Board of Education* of Pennsylvania has reserved \$100,000 of the \$1,000,000 appropriation for vocational work for "emergency courses" of the greatest benefit to the government.

A *metal trades school* for boys and young men has been

opened in New Orleans thru the co-operation of the metal trade manufacturers. The school will offer day and evening classes of sufficient scope to supersede the apprenticeship training. The school will operate as a separate institution until the completion of the Delgado Trade School, when the two will be merged.

Providence, R. I. A vocational guidance bureau has been opened for the benefit of boys and girls who have left school to seek employment. It is the purpose of the bureau to aid boys and girls in obtaining employment for which they are best fitted by inclination and ability.

The *Tennessee Vocational School for Girls* opened its doors for the first group of students in April. The school was opened under the auspices of the Tennessee Federation of Women's Clubs and is built on the cottage plan. The school has accommodations for one hundred students and provision has been made for a kitchen garden in the rear of the structure.

The *board of education* of Columbus, O., has adopted a program for school war gardens prepared by J. C. Hambleton, supervisor of nature study and gardens. It is estimated that thirteen thousand pupils have places for garden work during the summer.

Chicago, Ill. A continuation school for girls and women has been opened in the McClurg Building. The school is under the direction of Mr. William Bachrach and affords opportunity for office girls and women of the loop to obtain training in spelling, arithmetic, English, and business practice. Instruction is given in the use of the adding machine, dictaphone and multigraph.

The *art departments* of the New York City high schools were recently honored with an opportunity of exhibiting the work of the present school year in the galleries of the American Museum of Natural History and the Brooklyn Museum. In the same institution, the high schools of Manhattan, the Bronx and Long Island occupied a large hall, and in the Brooklyn Museum seven Brooklyn high schools occupied the main hall.

The choicest examples from all the contributing schools are to be shown in May at the gallery of the Art Alliance of America. The Alliance has offered prizes of \$100 for the best in each of the divisions of the work.

The *Art Alliance of America* held during the month of April an exhibition of containers and labels showing artistic boxes and

"AMERICA PROUD OF ITS OWN."

and America's cultured students in wood-working are proud to use their skill on a native Cabinet Wood that ranks with the greatest of foreign woods.

RED GUM

BEING

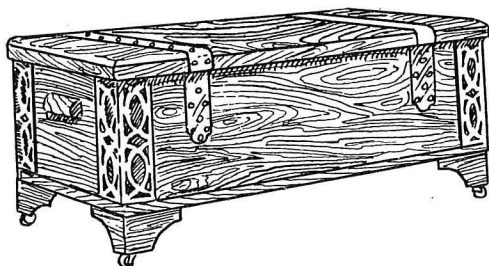
"AMERICA'S FINEST CABINET WOOD"

is naturally adaptable for all kinds of craftsmanship where beauty of grain, ease of working and very reasonable price are things desired. In veneers it is superb.

Drop a card for the Red Gum books (free) and we'll see that you are able to get the wood easily. Write frankly to

Gum Lumber Manufacturers' Ass'n.

1315 Bank of Commerce Bldg., Memphis, Tenn.



Cedar Chests: How to Make Them

RALPH F. WINDOES
*Instructor of Manual Training,
Davenport, Ia.*

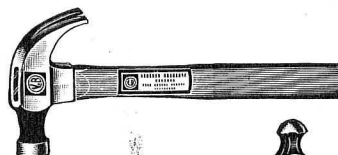
A complete reference book on Chest Construction for students, teachers, and others interested in Cabinetmaking. Contains chapters on Red Cedar, the Construction of Chests, Chest Designs, the Finishing of Cedar, Artistic Metal Trimmings, the Making of Matting Boxes. Fully illustrated and handsomely bound in cloth. Price, postpaid, \$1.

ADDRESS ORDERS TO
The Bruce Publishing Company
206 Montgomery Bldg. MILWAUKEE, WIS.

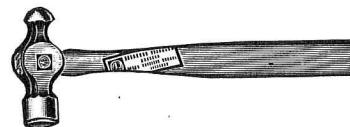


V&B Tools

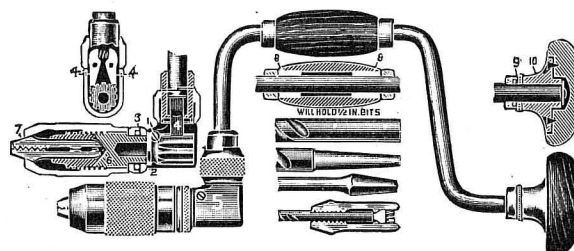
Every tool tested before
it leaves our factory



Nail Hammer



Ball Pein Hammer



Number 333 Brace. Patented construction. Will hold all bits up to one-half inch.

*Write for complete circulars of tools
for the Manual Training Shop*

VAUGHAN & BUSHNELL MFG. CO.
Makers of Fine Tools CHICAGO



MANUAL TRAINING School Equipment Benches, Tools, Supplies Jewelers' Tools and Supplies

We are sole agents for the Rose Hammers and Anvils for Copper Work and are specialists in the complete Tool Outfitting of Manual Training Schools.

Present conditions suggest the early purchase of Fall Equipment.

Send for our new illustrated Catalogue and allow us to quote you on your requirements.

BELCHER & LOOMIS HARDWARE CO.
PROVIDENCE, RHODE ISLAND

labels used by American manufacturers. A section of the exhibition was devoted to original designs prepared by leading artists for labels and cartons to be used in South American trade. Members of the American Institute of Graphic Arts offered the criticism of the exhibit. A large number of designs were submitted by students in the New York City high schools.

The Industrial Arts Department of Oklahoma City, Okla., has completed ten game tables for the Army Y. M. C. A. The department has also completed twenty individual boxes for use in base and post hospitals. The boxes are intended as containers for the personal articles of soldiers who may be confined in the hospitals. The work was done under the direction of Mr. H. F. Rusch, supervisor of industrial arts.

Harvey, Ill. The public schools of Harvey, Ill., have made the following report up to April 1:

The teachers and pupils have invested a total of \$8,632.25 in Liberty Bonds, Thrift and War Savings Stamps. The sum of \$210.71 has been raised for the Red Cross Fund, of which all the teachers and pupils are members.

More than five hundred pupils have offered to do war garden work. In several classes one hundred per cent has been reached, which means that every child will have a war garden. The entire school is making a drive to reach one hundred per cent in all patriotic activities.

Oklahoma City, Okla. The Oklahoma City schools recently held their second annual Birdhouse Contest. The prizes, which were in the form of War Savings Stamps, were donated by a commercial organization of the city. The birdhouses were sold to the highest bidder and the proceeds turned over to the Junior Red Cross Fund.

The art and manual arts departments, under the direction of Miss Monon, held an Easter sale of articles—book ends, candlesticks, bowls, door stops, toys, match holders, yarn holders, and handwork for the benefit of the Junior Red Cross work. The total sales amounted to approximately \$150.

The Johnstown (Pa.) Vocational School has recently occupied a new three-story home. The building was originally erected by the Johnstown Automobile Company, and is almost ideal for a school shop. Mr. Arthur F. Payne is director of the school.

The Kamehameha School for Boys in Honolulu, T. H., has reorganized its courses of study to co-ordinate its academic and industrial departments. Shop and trade work have been the basis of its courses since its establishment 27 years ago. At the present time it gives vocational training in carpentry, electricity, machine shop work, painting, forge work, and agriculture. It has the only completely equipped school shops for industrial education in the Hawaiian Islands and its graduates fill many responsible and paying positions in the plantation shops and in government employ. It is a well endowed school and was established by the will of Princess Bernice Pauahi Bishop, niece of the late ex-Queen Liliuokalani. Only those of Hawaiian blood are admitted as students. Chas. R. Bostwick, formerly supervisor of practical arts in Plainfield, N. J., has been principal since 1915.

"*The Print Shop News*" is the title of an interesting six-page monthly paper, issued by the printing students of the high school at Marinette, Wis. The March issue of the News is an industrial number and contains in addition to the usual student news, articles on the vocational courses offered in the Marinette High School. A page is devoted to tested recipes of war substitute dishes.

Mr. J. M. Dorrans, supervisor of manual arts for the State of Wisconsin, has recently reported that 133 high and grade schools have manual training courses. Nine towns added the subject to their courses this year and many schools are installing new equipment despite the high cost of such material.

Wheeling, W. Va. The evening school closed its annual sessions April 2 with a total enrollment of 823.

The Federal Vocational School for the conscripted men of Wheeling has an enrollment of 159 in the work of the Air Division of the United States Signal Corps.

The draftees are instructed in aeroplane and auto repairing, ignition and magneto repair, tinsmithing and copper-smithing, engine repairing and oxy-acetylene welding. An acetylene generator has been installed. Instruction is given under the direction of nine instructors of the head of the manual training department of the schools.

The expenses, \$550 per month, are defrayed in part from the Smith-Hughes Fund and in part by the citizens of Wheeling, the superintendent of city schools being the federal representative of the vocational board and in general charge.

Several welders and chauffeurs have been called to the cantonments and assigned work in the Air Division as skilled mechanics.



SIMONDS

INSTILL TOOL

QUALITY INTO YOUNG MINDS

Tool Quality means that the article must be backed by a reputation such as the Simonds Saw has. It is a New England Made tool, made on merit, with a strong company back of it and guaranteeing it. Our line consists of saws for all wood or metal cutting purposes in Manual Training or Shop work.

Write for Catalog

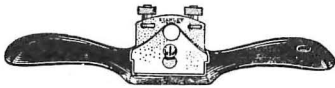
Simonds Manufacturing Company

"The Saw Makers"
Established 1832
Five Factories Fitchburg, Mass. Twelve Branches

*"I Tell You It's
A Great Saw"*

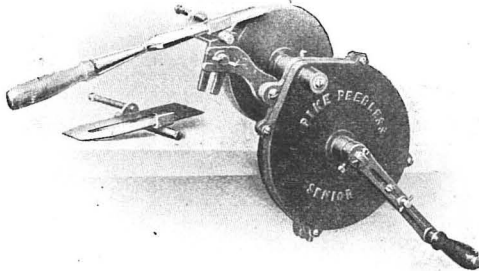


In "Making Up" Your Specifications



for supplies and equipment for the next school term, be sure to get in touch with us.

We are in position to supply you with "Quality" machinery and tools, absolutely guaranteed to give satisfaction.



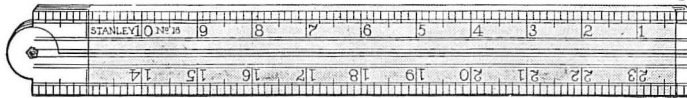
Illustrations herewith show some of the goods that we handle. However, we have a complete line and shall be pleased to quote you prices. Immediate shipment can be made. *Write*

RUPERLIN SALES CO.

222 N. WABASH AVE.

CHICAGO, ILL.

C. P. Periolat (Formerly with Orr & Lockett Co.)



AGRICULTURAL WOODWORKING

By Louis M. Roehl

THIS book presents a group of carefully graded problems in woodworking for rural schools, agricultural high schools and farm workshops. The introductory problems include full directions and photographs covering the essential tool processes.

All of the material presented in the book has been fully tested in the schoolroom and on the farm for educational value, simplicity, general utility and economy.

Cloth, 6½x9½ in. Price, \$1.00.

Address

The Bruce Publishing Co.
MILWAUKEE, WIS.

CHANNON



Everything
for
The School Shop

Machine Tools
Small Tools
Shop Supplies
for Wood and
Metal Workers
Draughting
Instruments
Etc.

The New York Study Chair.

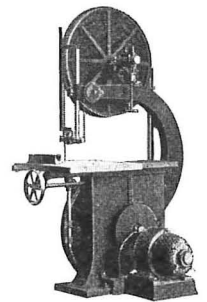
The one school desk which meets every requirement of modern educational work.

Concentrate Your Purchases

No matter what tool or supply you need, rest assured that if it is to be had, we either have it in stock for immediate shipment, or have special facilities for making prompt delivery.

You cannot better the quality, service or prices we offer.

Write for our General Catalog 80,
1150 pages



H. Channon Company, Chicago.

FOR

QUALITY LUMBER

AND

PROMPT SHIPMENTS

WRITE

EVERETT FRAIN CO.

NEW LOCATION

450 N. HERMITAGE AVE.
CHICAGO

PROGRAM OF THE DEPARTMENT OF VOCATIONAL EDUCATION AND PRACTICAL ARTS OF THE N. E. A.

President Frank H. Shepherd has completed the program for the meeting of the Department of Vocational Education and Practical Arts, which will be held in connection with the Department of School Administration at Pittsburgh, July 3 to 5. The general topic will be "Re-education During and After the War."

The program is as follows:

Wednesday Morning, July 3.

The Rehabilitation of Disabled Soldiers and Sailors and Victims of Industry—Charles H. Winslow, Assistant Director of Research, Federal Board of Vocational Education, Washington, D. C.

The Re-education of Returning Soldiers After the War—Frank Duffy, General Secretary United Brotherhood of Carpenters and Joiners, Indianapolis, Ind.

The Re-education of Crippled Men—Major W. H. Henderson, United States Sanitary Corps, Washington, D. C.

Vocational Re-education of Disabled Soldiers—Canada's Experience—I. B. Kidner, Vocational Secretary, Military Hospitals Commission, Ottawa, Canada.

Wednesday Afternoon, July 3.

Joint session with the Department of School Administration. David B. Oliver, Pittsburgh, Pa., chairman.

Topic: Readjusting Our Schools to the Needs of the Nation.

Vocational Education in Wisconsin with Relation to Federal, State and Local Boards—Frank L. Glynn, Director of Vocational Training, U. S. Aeroplane Works, Buffalo, N. Y.

The Home Maker and Reconstruction—Adelaide S. Baylor, President National Council of Executive and Administrative Women, Indianapolis, Ind.

A State Plan for Vocational Education—Commissioner John H. Finley, Albany, N. Y.

The Readjustment of the School from the Viewpoint of a Manufacturer—James P. Munroe, Vice-Chairman Federal Board of Vocational Education, Washington, D. C.

Thursday Morning, July 4.

Topic: Education for Industrial Efficiency.

The Influence of War Conditions on Vocational Education for Girls—Mary Schenck Woolman, Specialist in Vocational Education, Boston, Mass.

Educating Boys for Life in a Democracy—Louis L. Park, Superintendent of Welfare, American Locomotive Co., Schenectady, N. Y.

Education in Preparation for Life—Arthur E. Holder, Member of Federal Board of Vocational Education, Washington, D. C.

Thursday Afternoon, July 4.

Topic: A National System of Vocational Education.

Schools and Democracy—Louis H. Carris, Assistant Director for Industrial Education, Federal Board of Vocational Education, Washington, D. C.

The Training of Teachers for Industrial Education Under the Smith-Hughes Act—R. J. Leonard, Federal Agent for Industrial Education, Indianapolis, Ind.

Vocational Education Under the Smith-Hughes Act—C. A. Prosser, Director of the Federal Board of Vocational Education, Washington, D. C.

Friday Morning, July 5.

Joint session with the Department of Rural and Agricultural Education. Fred L. Griffin, Department of Rural Education, Cornell College of Agriculture, Ithaca, N. Y., chairman.

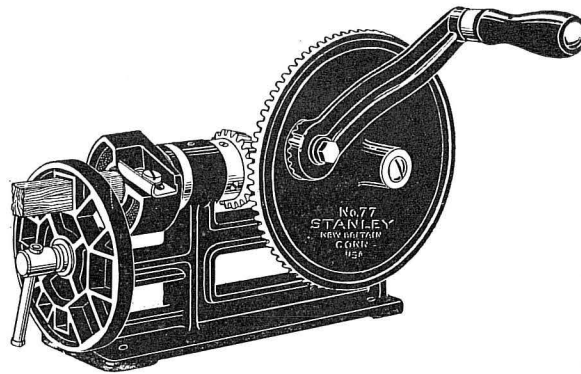
Topic: Rural Schools and Agriculture in Relation to the National Needs.

Vocational Progress and the Rural School—L. H. Dennis, Director of Agricultural Education, Bureau of Vocational Education, Harrisburg, Pa.

The Place of Agriculture in our National Program of Education—L. S. Hawkins, Assistant Director of Agricultural Education, Federal Board of Vocational Education, Washington, D. C.

Meeting the Demands for Vocational Education in the
(Concluded on Page XXVII)

Stanley Tools



STANLEY

Dowel and Rod Turning Machine

No. 77

A tool that will commend itself to Supervisors and Instructors of Industrial Education for use in cabinet, pattern or furniture making.

It will not only cut dowels of varying sizes and lengths to perfect dimensions, but with it one can also form rods of practically any length.

Ready made or stock dowels have a tendency to warp and shrink, making them very unsatisfactory to use where a close fit is desired.

With this machine dowels can be cut when needed and, furthermore, of the same wood that is being used for the work in hand.

One cutter head complete for making dowels or rods $\frac{3}{8}$ inch in diameter is furnished with each machine.

Additional cutter heads with cutters $\frac{1}{4}$, $\frac{5}{16}$, $\frac{7}{16}$, $\frac{1}{2}$, $\frac{9}{16}$, $\frac{5}{8}$, $\frac{11}{16}$, and $\frac{3}{4}$ inches can be furnished if desired.

With one of these machines and a Stanley Doweling Jig, accurately fitted dowel joints can be made with surprising quickness.

Price with $\frac{3}{8}$ inch cutter head, . . \$8.50
Additional cutter heads, 80c each.

Manufactured by

STANLEY RULE & LEVEL CO. NEW BRITAIN, CONN. U.S.A.

BRADLEY'S TONAL-TEMPERA

THE PERFECT COLORS FOR POSTERS AND DESIGN

Colors of distinctive character, giving life and snap to any subject. They provide a medium of the highest standard for effective poster work.

The six Tonal Standards are modified in value to such an extent that they are specially desirable for artistic design work, or for background washes in posters; while the full, rich tones of the more intense colors, used in combination, provide for striking and harmonious contrasts in the details of the poster or picture.

TONAL-TEMPERA COLORS dry quickly and one color may be over-painted with another without disturbing the first surface.

TONAL-TEMPERA COLORS are put up in tubes, $3\frac{1}{2}$ inches long by $\frac{1}{2}$ inch diameter. Made in fifteen beautiful colors, as follows:

Tonal Red	Tonal Green	Chinese White	Vermilion	Ultramarine
Tonal Orange	Tonal Blue	Black	Chrome Yellow	Violet No. 2
Tonal Yellow	Tonal Violet	Carmine	Chrome Green	Sepia

Price, per tube, \$.15

MILTON BRADLEY COMPANY

Springfield, Massachusetts

Boston

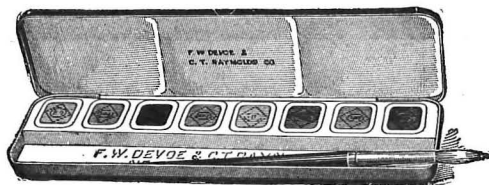
New York

Philadelphia

Atlanta

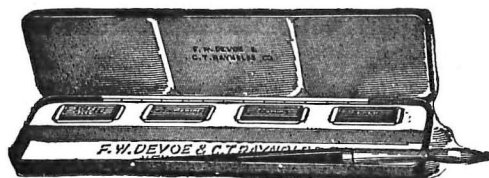
San Francisco

IT is easy to do good work if you have the right things to work with, and that is why so many use Devoe School Water Colors.



Set No. 118

Made in cakes, pans and tubes.



Set No. 122

Everything for school art work, including modeling material, Devoe Show Card Colors, Brushes and other supplies can be had at a Devoe dealer, or

DEVOE

New York

Chicago

Kansas City

New Orleans

Artists' Materials Drawing and School Supplies



F. W. & Co.'s "Students" or School Water Colors

In tubes, half pans, and cakes

F. Weber & Co.'s Water-proof India Inks

Black and Nine Colors

"Sphinx" Superior Crayola

"FABRIANO" Handmade Water Color and Drawing Papers

SCHOOL DRAWING PAPERS, DRAWING INSTRUMENTS, BOARDS, TABLES

Equipment of Art and Drawing Rooms a Specialty

FRENCH PEN PAINTING OUTFITS AND MATERIALS

F. WEBER & CO.

Manufacturers and Importers

Artists' Materials and Drawing Supplies

1125 CHESTNUT STREET

Branch Houses } St. Louis, Mo. PHILADELPHIA, PA.
Baltimore, Md.

(Concluded from Page XXV)

Rural Schools—H. W. Foght, Director of Field Work, Bureau of Education, Washington, D. C.

Problems in Vocational Agricultural Education as Set Forth in the Smith-Hughes Act—Charles A. Greathouse, Member Federal Board of Vocational Education, Washington, D. C.

NEW BOOKS AND PAMPHLETS.

Industrial Experience of Trade School Girls in Massachusetts.

Edited by May Allinson, Ph. D. Cloth, 275 pages. Price, 80 cents, net. Published by the Women's Educational and Industrial Union of Boston, Mass.

This is a ninth volume of the valuable series of industrial studies prepared by the Department of Research of the Women's Educational and Industrial Union of Boston. While it is limited to a study of conditions in Boston and Worcester, its applicability for establishing principles to guide the planning of industrial courses for girls is universal.

The study takes up the value of trade education as expressed in the stability of the girls who enter the industry for which they are trained, the wages which they receive and the length of time they remain in the industries. The volume should be studied by every administrator of girls' trade classes.

Things Girls Like to Do.

By Elizabeth Hale Gilman and Effie A. Archer. Cloth, 246 pages, plus 293 pages; illustrated. Price, \$2.50. The Uplift Publishing Company, Philadelphia and San Francisco.

Two women of long experience have prepared this volume which is in reality two complete books in one cover. The first half by Miss Gilman is a very practical and complete presentation of the general problems of home management. It takes up the details of household work from selecting fittings and furniture to the arrangement of menus, marketing and household accounting. It is written very simply and logically, but it appeals to us as being of more interest to mature women and girls than to children of elementary school age to whom it is apparently addressed.

In the second part of the book, Miss Archer offers a complete description of the various home needlecrafts. She begins with the simplest home sewing and leads from this to plain embroidery, crocheting and lace making. She writes most interestingly and gives evidence on every page of her experience as teacher of young girls. She includes nearly three hundred illustrations in the text so that every step which might be misunderstood is made fully clear. Nice discrimination is shown in suggesting only problems in sewing and embroidery work which are likely to interest young girls and to be fully within their abilities.

The book will be found valuable in every school where home making courses are offered. It also fits splendidly into the home library.

The Child's Food Garden.

By Van Evrie Kilpatrick, Principal of the Carlisle School, New York City. Cloth, 64 pages; illustrated. Price, 48 cents, net. The World Book Company, Yonkers-on-Hudson, New York and Chicago.

This is a first book in garden management and is intended for the youngest pupils. While it is extremely brief, and the language is simple, it is thoro and exact, and is worth having in every school for reference purposes.

Food Preparation.

Part I and II. By Beth Warner Josserand. Cloth, 148 and 142 pages, respectively. Price, \$1.25 each. The Manual Arts Press, Peoria, Ill.

In these books, publishers and author offer a combined laboratory guide, textbook and notebook for the use of high school classes in domestic science. Their arrangement saves the time required by the dictation and blackboard method of giving out data.

The work is arranged in two parts. The scope of Part I is shown by the headings of its five chapters: Introductory Lessons, Water, Minerals, Proteins, Fats. One instance will illustrate the scientific attitude of these books. Minute directions are given for determining the effect of heat on solids in meats, but pupils are expected to note down stages in the work and to draw their own conclusions. Other ex-

(Continued on Page XXIX)

TRADE
CRAYOLA
MARK

Drawing Contest

to stimulate the children's
interest in drawing we offer—

\$600.00
in Prizes



Tell the children in your class
about the "Crayola" Contest

—for children under 15 years of age.
—for young people 15 to 18 years of age.

8 First Prizes—Each a \$50 Liberty Bond

8 Second Prizes—Each \$25 in War Savings Stamps

40 Additional Prizes—for Honorable Mention

Write to our Contest Department
and get the circular describing the
details of this drawing
contest so you
can give the children
in your class a chance
to win one of the
many prizes.

"Crayola" No. 8 is the
standard school set.

**ACT NOW—Contest
closes August 31st.**



BINNEY & SMITH CO.

Makers of Gold Medal Crayons

81-83 Fulton St.

New York, N. Y.

Arts and Crafts Teachers

And Workers in Precious Metals

We make a specialty of supplying you with:

All of these in sheet or wire form

Sterling Silver
Pure Silver
Pure Gold
Gold made up in all Karats. Also
Red, Green, White and Yellow Gold
Silver Solder
Platinum and Platinum Solder

Our prices are reasonable.

Credit accounts extended to instructors and schools.

Prompt attention given to all orders.

Send for Price List and Weight Tables, Dept. A.

THOMAS J. DEE & CO.

5 South Wabash Ave.

CHICAGO, ILL.

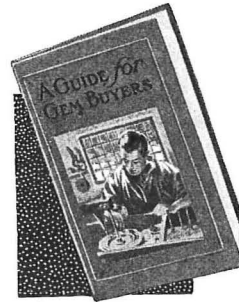
EMERALDS

For Jewelry Craft Workers
In Schools and Colleges

The Emerald is such a rare stone it can seldom be offered at a minimum price, but we now have some attractive Gems, received from Russia, which we can offer at a very low price. Selections sent to responsible parties.

We also supply Diamonds at regular wholesale prices.

A Guide for Gem Buyers
A handsomely illustrated book of interest and value to Jewelry Crafts workers. Sent without charge to jewelry workers on request.



ESPOSITER, VARNI CO., Inc.

Gem Dealers and Cutters

Frankel Bldg., 45 John Street

New York

School Drawing Books

Practical Drawing

Modern Arts Course

School Movement Writing Books

Practical Writing Course

School Art Materials

Schoolroom Pictures

School Supplies

*Write nearest agency
for prices and catalog*

PRACTICAL DRAWING COMPANY

Dallas

Chicago

Atlanta



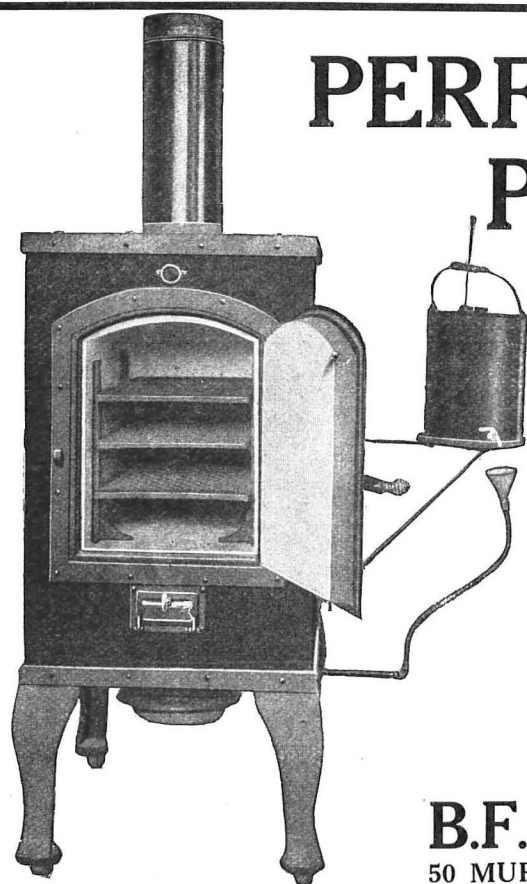
PLANS FOR THE LIBERTY MOTOR

were made by TWO HUNDRED DRAFTSMEN working at one time. THOUSANDS OF DRAFTSMEN have been taken into the SERVICE, leaving THOUSANDS OF OPPORTUNITIES for the boys now being trained. DON'T TRY TO DELAY THE GAME by trying to teach mechanical drawing with make-shift equipment. SHELDON'S DRAWING TABLES ARE PRE-EMINENT for convenience, durability and efficiency.

Write for Catalog No. 16

E. H. SHELDON & COMPANY

Muskegon, Mich.



NO. 6 PERFECTION KILN
Equipped with Kerosene Oil Burner.

PERFECTION BEST POTTERY KILNS BUILT

For Firing Biscuit, Clay Bodies and Glazes.

EQUIPPED FOR

Kerosene Oil, Manufactured and Natural Gas

For Educational and Technical Purposes.

SAFE! CLEAN! DURABLE! PERFECTION KILNS

For Firing Decorated China and Glass.

MOST MODERN KILN CONSTRUCTED

UNIVERSAL SATISFACTION

B.F. DRAKENFELD & CO., Inc.

50 MURRAY ST.

NEW YORK, N. Y.

Illustrated Catalogue Mailed on Request.

(Continued from Page XXVII)

periments are recipes, practical applications of principles previously demonstrated.

Carbohydrates—sugar, cereals, vegetables, bread, cake—receive attention in Part II. In the appendix are lessons upon the preservation of fruits and vegetables. Lists of farmers' bulletins are frequent. The discussion of the digestive and nutritive value of each food studied is highly practical. Blank leaves give pupils a convenient place for notes and additional material.

The preparation of food has passed from the empirical to the scientific stage. The publishers are justified in saying that these books should make clear "the fact that the teaching of the correct methods of preparing food is now on as sound a scientific and pedagogic basis as the teaching of physics or chemistry, of biology or physiology."

Dressmaking.

By Jane Fales. Cloth, 508 pages; illustrated. Charles Scribner's Sons, New York, Chicago, Boston.

This large, closely-written, valuable book comes from the pen and the experience of the director of the department of textiles and clothing, Teachers College, Columbia University. It is a textbook for both teacher and student in colleges and schools (above the elementary) where sewing or dressmaking is taught.

The development of this art is traced in the introduction. Once it was sufficient to have garments well made. Now they must also be suitable, useful, tasteful. An actress distinguished for good dressing on and off the stage once said that a woman in selecting a garment should remember her age and appearance, her income and the uses to which the garment would be put.

Some fifty wood cuts illustrate the historic development of costume from the days of the ancient Egyptians to the year 1870. Some of these costumes were fantastic, some were burdensome, but few were beautiful. As a knowledge of textiles is needed to insure a judicious selection of dress materials, the fibers—cotton, wool, silk, linen—are traced thru

the processes of carding, spinning, weaving. The sections on different weaves and tests for fabrics are distinctly practical. By far the larger part of this work is naturally taken up with dressmaking proper. Some general suggestions come before detailed instructions upon drafting and patternmaking. A long step in advance brings the learner to pattern-designing and draping, with the final touches of finishing and embroidery.

The standard that dress should be suitable, even beautiful, is always implied and often expressed.

Record Forms for Vocational Schools.

By Joseph J. Eaton. Cloth, 56 pages. Price, 60 cents. Illustrated. World Book Company, Yonkers-on-Hudson, New York.

"Record Forms" is not the work of tyros. The author has had twenty years' practical experience in vocational schools to back up this book. He has also had the assistance of a certified public accountant and efficiency engineer who has specialized in factory work.

Size, shape, spacing of each class of records is illustrated and explained. Different spaces are indicated for the record of pupils, instructors, supplies and maintenance, shop production, building and grounds, forms for reports required of the school. Great care has been taken to call for only a sufficient number of details.

Materials for the Household. Circular No. 70. Paper, octavo, 259 pages. Issued by the U. S. Bureau of Standards, Washington, D. C. (Limited edition, free. Price, 25 cents. Superintendent of Documents, Washington.)

This book presents in popular form a vast amount of valuable information on several thousand materials and in the construction, equipment and conduct of homes. It is the first popular treatise, offered for general distribution, in which the technical work of the Bureau of Standards is made available.

In the variety of topics and practical point of view, the publication is unique and will prove especially valuable at

(Concluded on Page XXXI)

Your Country Calls for Trained Men

To meet the needs of the army and navy and air service Uncle Sam is calling for thousands of trained workers.

These books will help students to quickly acquire the practical knowledge necessary.

Applied Mechanical Drawing

By Mathewson

Shop Mathematics

By Holton

Notes for Mechanical Drawing

By Mathewson

Forge Shop Practice

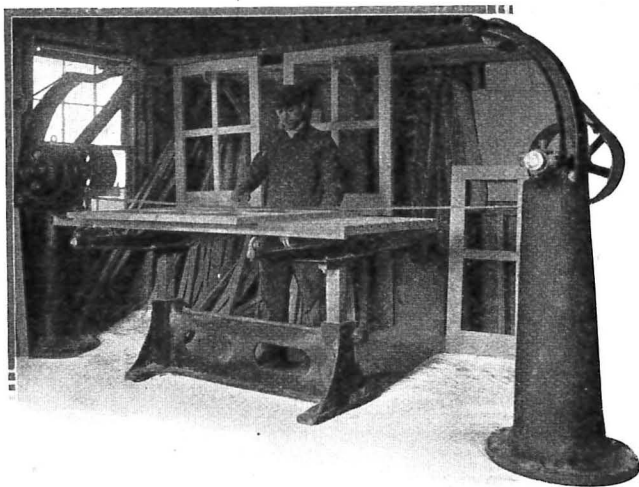
By Littlefield

Sent on 10 days' approval for examination.

THE TAYLOR-HOLDEN CO.

PUBLISHERS

SPRINGFIELD, MASS.



The Most Practical Belt Sander For Manual Training Schools

BECAUSE the Mattison Hand Block Machine does the complete sanding of an unlimited variety of flat and curved surfaces, it is particularly desirable for Manual Training Work.

It takes up little floor space, is easy to operate, and has no complicated parts to get out of order.

First cost is reasonable, and upkeep expense is hardly noticeable.

*Send for Free Descriptive Bulletin
and copies of "Mattison Methods"*

MATTISON MACHINE WORKS
857 FIFTH STREET, BELOIT, WIS.

DON'T TAKE OUR WORD

Pick up any newspaper and you will see where large concerns are begging for sheet metal workers at 60c to 65c per hour for 8-hour day. This is for ordinary mechanics. Men with a knowledge of blue-prints, patterns, etc., as taught in the up-to-date schools are getting much more.

GIVE YOUR BOYS A CHANCE

to make some of this good money. Install an equipment of sheet metal machines and tools in your school. The cost is small, the work is healthful and the boys enjoy doing the work.

We are distributors for the famous Peck, Stow & Wilcox Co.'s line of machines and tools; also carry a complete line of supplies.

Write for our catalog, also literature on this up-to-the-minute trade.

BERGER BROS. CO.

229-231-237 ARCH STREET
PHILADELPHIA

YOU can now take the drudgery out of shop practice with absolute safety. Speed up the boys' work to generate enthusiasm, increase their experience and instil confidence. Make them better "fit".

THE WALLACE BENCH PLANER

has a safety circular cutter head, its throat opening measures less than an inch—a naturally safe machine—but we've added our patented Flap and Shutter Guard, which makes it absolutely "fool proof". The Underwriters' Laboratories endorse it.

It is the hustler that will do your planing, jointing, beveling, surfacing, etc., in a jiffy.

Request details and our trial plan.

Boost the boys to success.

Address:

J. D. Wallace & Co.

1415 Jackson Blvd.,
CHICAGO,
U. S. A.



A NEW BOOK FOR SECONDARY SCHOOLS

Ready for delivery June 20th

By H. F. Rusch, Director of Manual Training, Oklahoma City, Okla., and Claud C. Conway, Director of Iron Work, High School, Oklahoma City, Okla.—men who are pioneers in industrial work and who have been successful teachers of it.

These men—practical teachers—have given you a **practical text book** covering a two-year course in joinery, cabinet making and carpentry. It conforms to the latest ideas, is concise, complete and easily comprehended by both teacher and pupils.

Contains 350 pages with over 200 drawings and illustrations exclusive of 24 full-page blueprints which are actual working drawings.

Four parts—(1) Tools and their Uses; (2) Joinery, Cabinet Making and Carpentry, a clear, concise presentation of the fundamentals together with outline drawings of suggested projects; (3) Shop Talks—a series of twelve chapters providing expert knowledge of problems which confront the artisan in his daily practice; (4) Problems and a Glossary of Technical terms.

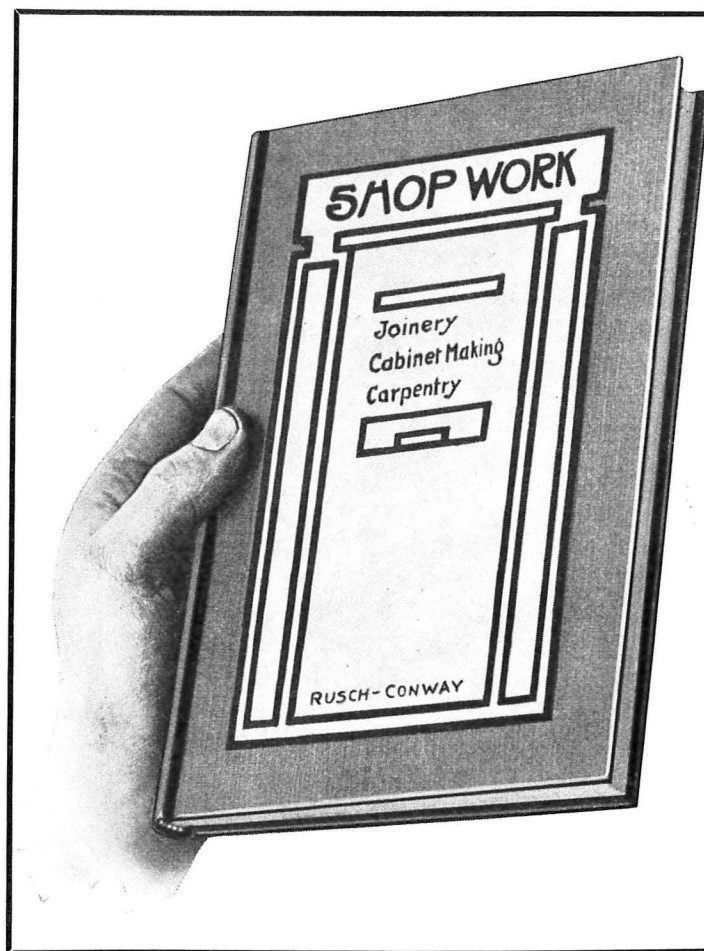
With "Shop Work" as your text book, the success of your woodworking is assured. Get a copy before making your selection for next year's work.

Price \$1.20, postpaid
Special adoption rates

THE INDUSTRIAL BOOK AND EQUIPMENT CO.

425 W. Maryland St., Box 1009, Indianapolis

Complete line of industrial texts, supplies and equipments



(Continued from Page XXIX)

this time when national welfare depends so much on the more efficient management of the home. A copy of the book should be in every classroom where home economics is taught. In fact it will make a splendid basis for a complete course on household materials.

Manual arts teachers will find the book a valuable reference in teaching the fundamental facts on wood, clay products, metal, rubber, cement, plaster, paints, leather, textiles, paper, soap, disinfectants, fuels, preservatives, lubricants, etc.

Course of Study for the State Graded Schools of Wisconsin. Issued by the State Department of Education, Madison, Wis. The pamphlet contains the course of study in manual training and domestic science for the seventh and eighth grades, together with lists of books and tools and equipment.

Judging Sheep as a Subject of Instruction in Secondary Schools. H. P. Barrows, specialist in agricultural education, Bureau of Education. The bulletin, which was prepared under the direction of C. H. Lane, specialist in agricultural education, is intended for the use of teachers of secondary agriculture. The pamphlet discusses classroom instruction, description, practice judging and includes a bibliography on sheep breeding and the sheep industry.

Some War Uses of Concrete. Published by the Portland Cement Association, Chicago, Ill. The pamphlet lists under topic heads, various references to uses of concrete associated with the offensive and defensive needs of war. Copies may be obtained by addressing the Library of the Portland Cement Association at Chicago.

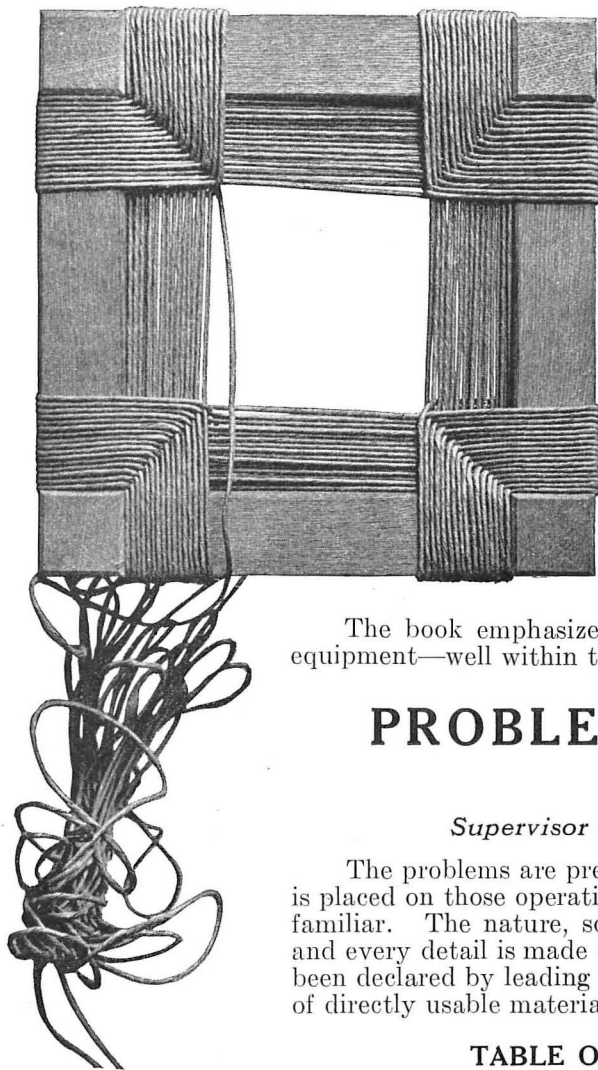
The Artisan. The official publication of the William Hood Dunwoody Institute, Minneapolis, Minn. The paper is devoted principally to the part played by Dunwoody in training recruits for the army and navy trades. A total of 280 men have been enrolled in 21 different trades. Of all the trades represented, the automobile drivers stood highest in number, having 141 men. The Institute has organized a company of bakers, a battalion of signal men, and has trained a company of four hundred men as artisans for the navy. The printshop also gave its service in

supplying needed advertising material for the Minneapolis recruiting station.



Cooking Table made by Students in the Rochester, N. Y., Manual Training Shops.

Cane--Reed--Textiles-- Splint -- Metal -- Rush-- *Combinations with Wood in Furniture, etc.*



The combination of materials used constantly by craftsmen and commercial makers of furniture and other articles of home use is the big idea back of the book "Problems in Woodwork," by Edward F. Worst.

The author, who is a master craftsman as well as teacher, has developed from long personal experience in schools, from extensive travel and from wide observation and personal practice, a most interesting series of problems involving the use of ash splint, cane, rush, fibre, reed, raffia, hickory splint, textiles, metal, leather, etc. — with wood. These have been incorporated in the Chicago course of study in elementary manual training to broaden the interest, increase the number and character of processes and to give the entire subject a broader industrial and social value.

The book emphasizes projects which require a minimum of material and equipment—well within the reach of any school.

PROBLEMS IN WOODWORK

By Edward F. Worst

Supervisor of Elementary Manual Arts, Chicago

The problems are presented in the book in a logical sequence and emphasis is placed on those operations with which the average teacher is not likely to be familiar. The nature, source and use of all materials are fully explained, and every detail is made clear by drawings and photographs. The book has been declared by leading experts to be the most original and valuable collection of directly usable material offered in the past twenty years.

TABLE OF CONTENTS

I. Problems in Woodwork.

The Squaring Up Process — Solitaire Game — Nine Men Morris — Chip Carving — Stationery Holders — Bird Houses — Tabourets—Shoe Polishing Stand—Costumer — Telephone Table and Chair — Electric Lamp — Floor Lamp — Folding Table — Writing Desk — Working Drawings of Problems.

II. Metal and Wood.

Designs for Hinge Tails, Escutcheons and Draw Pulls — Working Drawings of Problems.

III. Ash Splint Work.

Trays and Baskets — Cutting Gauge — Cutting Splints—Making a Tray—Circular Basket — Making a Cover — Combinations of Wood and Splint — Making a Screen — Working Drawings of Problems.

IV. Cane Weaving.

Origin and Use of Cane — Making a Fernery — Steps in Five-Step Caning — Binding — Trimming — Four-Step Caning — Working Drawings of Problems — Caning an Old Chair.

V. Rush Seating.

Varieties and Sources of Materials — Method of Wrapping — Splicing Cord — Splicing and Twisting Rush — Stuffing Rush Seats — Wrapping a Rectangular Seat — Treatment of Irregular Shaped Seats—Working Drawings of Problems.

VI. Hickory Splints.

The Splints — Making a Bending Form — Fitting Tenons — Weaving — Working Drawings of Problems.

VII. Upholstering.

Simple Methods — Upholstering Chair Seats — Making Upholstered Cushions.

VIII. Round and Flat Reed Weaving.

Single, Double, Triple, and Quadruple Weaving — Making Mats — Beginning the Weave — Overcasting — Constructing Borders — Pairing Weaves — Making Closed Borders — Miscellaneous Mats — Weaving Baskets — Shaping Baskets — Finishing the Top — Various Small Baskets — Alternate Method of Beginning a Basket — Large Baskets — Handles — Covering Pottery Forms — Covered Sandwich Plate — Covered Vase and Bowl — Melon Shaped Basket — Problems involving Wood and Reed — Serving Tray — Foot Stools — Sewing Stands.

IX. Textiles and Wood.

Foot Stool — Waste Basket — Screens, Danish and Swedish Looms.

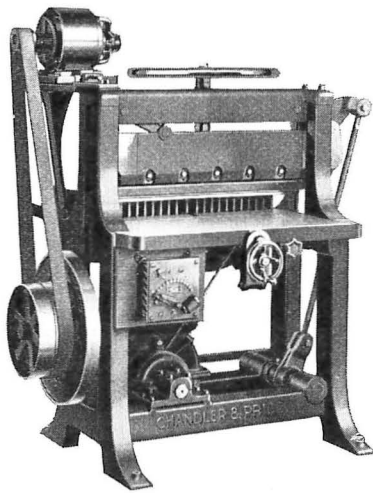
Appendix—Lumber Price Tables.

The book should be in every school and in every teacher's library. 245 pages, bound in cloth and printed on heavy plate paper. Price, \$1.75, net. Address

THE BRUCE PUBLISHING COMPANY

206 Montgomery Building

MILWAUKEE, WIS.



The Best Guarantee

The same sturdy reliability that has made Chandler & Price Presses successful for over 30 years is built into the Chandler & Price Cutters.

It is the best possible guarantee of the service you will receive.

BUY LIBERTY BONDS

Chandler & Price Cutters

The Chandler & Price Co., Cleveland, Agencies in All Principal Cities

The Chandler & Price Semi-Steel Chase—Guaranteed Against Breakage

THE WAR AND THE SCHOOLS.

Brainerd, Minn. A class in mechanical drafting has been formed at the night school for the benefit of drafted men.

Benton Harbor, Mich. The high school is engaged in war activities of an interesting nature. An exhibit of war breads made by the students has been held at the school. The pupils have also made garments for children and have knitted blankets to go with infants' layettes.

The Massachusetts Legislative Committee on Education has presented a bill authorizing the use by the federal government of certain institutions and other resources of the commonwealth and to establish a bureau for the re-education of soldiers and sailors disabled or diseased while in war service.

The bill authorizes the governor to transfer, either wholly or in part, the use and custody of any state hospital, school, or workshop and its equipment and employees to the state board during the war and for two years after its close, and the board is given power to appoint a director of re-education. An appropriation of \$20,000 is proposed.

A year's technical course condensed into two months is planned by the War Department for the drafted men who have reported at four universities in the State of Illinois. The men will have eight hours of shopwork and two hours of military drill and will be taught by experts called from all parts of the country.

The Washington Grammar School, Oakland, Cal., early in March, held an exhibit of articles made by the pupils for war relief since January of this year. The collection included sweaters, scarfs, wristlets, socks, ambulance pillows, clothing for refugee children and six large afghans.

Technical classes for training six hundred drafted men in aviation work have been opened in the technical schools of Chicago. It is estimated that the number of students will be increased to 1,500.

Products of the manual training and arts departments of the grade schools at Spokane, Wash., have been sold recently for the benefit of the Red Cross. The articles include baskets made of pine needles and fiber, waste baskets, decorated cans, post stamp albums, flower pots, foot stools, bird sticks, portfolios, vases, pictures and cook books.

The manual training department at Akron, O., recently com-

pleted ten checker boards for one of the camps in Florida. The work was done under the direction of C. A. Meister.

Albuquerque, N. Mex. A school of telegraphy has been opened in the high school to prepare boys and girls for government service.

The training of men of the national army in special vocational lines is to be undertaken in the schools of Erie, Pa. Ten instructors, selected from different camps, are to be assigned as instructors under the supervision of a commissioned officer. The training period will cover two months and will include carpentry, cabinet making, sheetmetal work, automobile repairing, wireless telegraphy, electrical work and pipe fitting.

Indianapolis, Ind. A vocational school for drafted men from the Kentucky district has been opened.

The Junior Red Cross of Saratoga Springs, N. Y., has done effective work in the design of war posters advertising the Liberty Loan. Attractive exhibits of the school posters were displayed in the store windows and a collection of the best were reserved for general distribution. More than two thousand posters were prepared by the department of drawing of the grade and high schools. The work of designing posters was undertaken by the department with a view of producing skilful workers who may in the future develop into expert artists.

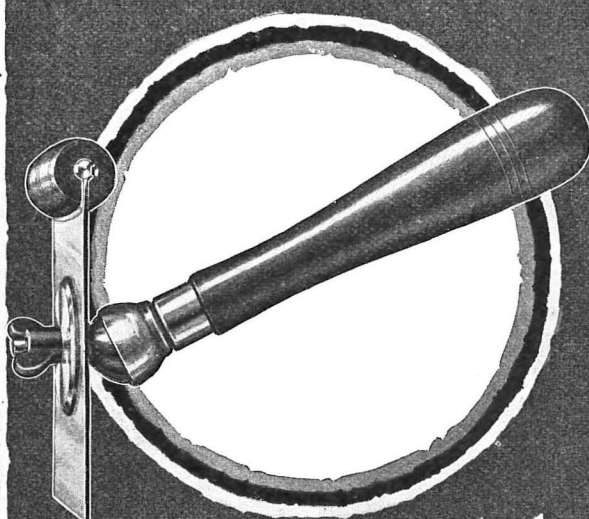
The New York City schools are conducting 124 continuation classes for the technical instruction of workmen of various trades in demand by the government. Classes are also conducted at the Navy Yard.

The school children of Buffalo, N. Y., have dressed dolls, made scrapbooks and knitting needles and collected old linen for various purposes. For the present, the children will devote their attention to the making of clothing for Belgian children.

The children of the Omaha public schools have made the following articles for the Red Cross surgical dressing department: 8,500 four-tail bandages, 1,700 many-tail bandages, 6,000 2"x2" gauze wipes, 1,500 shot bags.

The following articles were made for the hospital supply department: 800 hemmed towels, 2,000 bed socks, 1,000 hot water bottle covers.

The following articles were made for the knitting department: 4,000 knitting needles, 150 sweaters, 75 pairs of socks, 150 pairs of wristlets, 50 helmets, and 30 afghans.



Starrett Tools

A JOB YOU CAN BE PROUD OF

An elegant job can be obtained after your work is glued together only if all traces of glue, plane or clamp have been removed. Cramped positions make it impossible to remove such unavoidable defects without using a scraper. Cabinet makers and carpenters prefer a Starrett scraper, because it is so easily used in all sorts of places, and because it makes possible a job you can be proud of.

This is only one of the many useful Starrett Tools.

Write for our catalog No. 21CE which describes 2100 sizes and styles of fine instruments.

The L. S. Starrett Co.

The World's Greatest Toolmakers

ATHOL, MASS.

NEW YORK LONDON CHICAGO



42-790

BRINGING THE FARM TO CITY CHILDREN.

There has been a growing sentiment that the schools are not meeting the demands of the times, that they do not prepare for life. Boys and girls rush to the cities to engage in the cities' industries. How to overcome this condition has been the problem of school authorities thruout the country.

The "Harvey Plan" which was introduced at Harvey, Ill., by Supt. F. L. Miller, has attempted to bring the farm to the city thru encouraging and supervising back-yard and vacant-lot gardening by school children. Harvey is a city of ten thousand people, located in one of the large manufacturing centers, with agricultural environment. The board of education, with the best interests of the children in mind, decided to break away in a degree, from the traditional academic school and take up work similar to that carried on by Supt. Edward Tobin in the rural schools of Cook County.

Three men were employed for the entire twelve months at a salary of \$100, with an additional allowance of \$50 during the summer vacation. The men selected were principals of three of the largest schools whose united territory covers practically the entire school district. They were selected because of special proficiency in farm work and playground activities as well as efficiency in academic and professional service.

In laying out the work, three projects—gardening, poultry and canning—were selected. Preparations were made in early spring and much of the work was done before the close of school in June. Weekly and daily schedules were prepared by the supervisors with the assistance of the superintendent and weekly conferences were held in which the working details were arranged and ways and means were discussed. Canning clubs were formed of pupils from the fourth to the eighth grades. Each building set aside one room for the work, the children bringing vegetables and fruits from their own gardens to be canned under the direction of the supervisors. By the payment of a small sum, housewives of the city were able to order canned goods for winter use and the children received the proceeds.

Afternoons were devoted to garden and poultry inspections by the supervisors. Advice was given on soil, fertilizers, seed and pests, the supervisor giving practical aid on the spot. The poultry yards and rabbit pens were inspected for cleanliness, care of animals and preparation for marketing. Pupils were taught how to become good salesmen and saleswomen and how to hold their customers. All pupils kept record books with accurate accounts of money earned and spent and booklets were compiled giving the story of the garden and poultry projects.

A tabulation of the gross receipts for the year just closed shows that there were 210 gardens, with an income from produce amounting to \$3,400; 21 poultry projects with an income from eggs and fowls of \$600; and 10,000 jars of canned vegetables and fruits amounting to \$2,000. The total outlay of the board for salaries, gas and equipment did not exceed \$600 and the gross income from the projects amounted to \$6,000.

The prospectus for next year as given out by the principals, shows that practically every child has selected one or more projects. Two additional projects—sewing and business—have been added, plots will be enlarged and poultry yards extended. Several pupils have pooled their interests and will start work on a large scale. One principal reports that where he had 101 projects last year, he now has over four hundred listed for this spring.

Cleveland, O. The Boys' School at West 29th Street and Clinton Avenue has a cobbling class in successful operation. The boys are taught to repair shoes and all subjects of the curriculum correlate with the work of shoe cobbling. The success of the work at this school will mean its extension to the remaining schools of the city.

Mr. Frank Shepherd, associate professor of industrial arts at the Oregon Agricultural College, has been appointed assistant director of education and special training for the War Department in the northwest section. Mr. Shepherd will have as his territory the states of Oregon, Washington, Montana, Idaho, and Wyoming.

Mr. O. J. Kastel, of White Bear, Minn., has been appointed manual training instructor at East Grand Forks.

The Red Cross is making a nation wide appeal for discarded tracing cloth to be used in making surgical dressings. Drafts-men and teachers are requested to send any quantity which they may have to their local laundries or laundry owner's associations for washing and forwarding to the Red Cross Chapters. Both cotton and linen tracing cloth are usable.

Roll of Honor.

Mr. Edward Soderstrom, director of manual training, Stillwater, Okla., 357th Infantry, Camp Travis, Tex.

J. Thomas Bell, Norfolk, Va., U. S. Navy.

Morris E. Adelstein, Le Mars, Ia., National Army.

C. D. Cleaver, Anderson, Ind., National Army.

S. R. Harding, Newport, R. I., U. S. Navy.

INDUSTRIAL BOOK AND EQUIPMENT COMPANY ORGANIZED.

Guy M. Jones, who until recently was the manager of the Industrial Book and Equipment Co., of Indianapolis, Ind., has just announced the organization of the Guy M. Jones Co., Inc. The company plans to publish some interesting books on industrial and vocational education which are to be announced very shortly.



MR. GUY M. JONES
Indianapolis, Ind.

Associated with Mr. Jones are Messrs. F. O. Wiley, secretary of the company; H. C. Moore, treasurer; H. F. Campbell and L. H. Trotter, directors. The gentlemen are all of the highest repute in Indianapolis and the firm promises some interesting contributions to the cause.

Guy M. Jones is an old Indiana high school principal and has had a varied experience in the sale of material and equipment for vocational schools. This experience all very naturally has led to the organization of the present company. Announcements of the publications which the firm is now working on will be made shortly.

OFFER IMPROVED CABINET SURFACER.

The Oliver No. 61 Cabinet Surfacer has been a popular machine in the largest woodworking shops since it was first placed on the market more than ten years ago. Its chief merit has been its accuracy and the wide range of capacity for work both in soft and hard woods.

The new model is practically identical with the original machine and has its advantages of stability, safety and efficiency. It has in addition a new form of sectional chip breaker consisting of $1\frac{1}{8}$ " sections which have been found especially advantageous in heavy work. The entire graining is completely housed for the protection of the operator and for the maintenance of cleanliness.

The machine is provided with a new grinding attachment which is motor driven and which reduces the labor of grinding the knives of planers and jointers to a minimum. The attachment can be quickly mounted and the knives can be sharpened without removing them. The motor is mounted in the grinder head and is operated by means of an ordinary lighting circuit.

The firm has issued a complete circular which will be sent to any school official on request to the home office in Grand Rapids, Mich.

REMOVE OFFICES.

The James Clark, Jr., Electric Company has announced the removal of its Chicago office and stockrooms from 31 North Jefferson St. to 23-27 South Jefferson St., where larger quarters have been secured. The new location affords improved transportation and storage facilities for handling the well-known "Wiley" electrically-driven drills, hack saws, and grinders which the firm manufactures for school and general shop use. The office is in charge of Mr. Oscar P. Wodack.

A GRINDSTONE FOLDER.

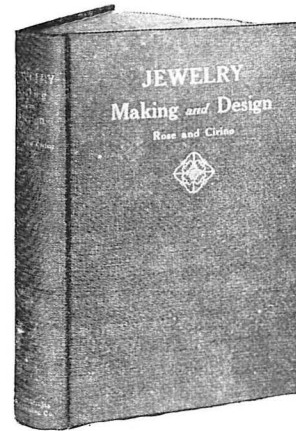
The Cleveland Stone Company has just issued a folder entitled "Selection and Care of a Grindstone." The folder is particularly interesting because it tells how to use a grindstone intelligently and just what is in the grindstone that actually gives the cutting edge. The folder will be sent for class distribution in whatever quantity requested. Address the School Department, care of Cleveland Stone Company, Cleveland, Ohio.

A Summer Course in Jewelry

AT HOME

If you had **THIS BOOK**
written by Rose and Cirino

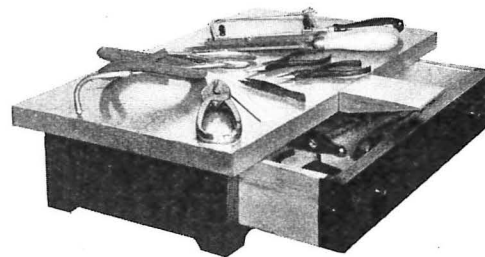
"As an amateur worker in metal, I find in it the equivalent of many courses in summer schools. As a teacher of design, I can refer to it without reservation as a convincing treatise on that subject. The color plates are exquisite."



and

THIS OUTFIT

designed by Rose



You would have all that anyone could have for a **Summer Course in Jewelry.**

A good Teacher and a good Equipment.

It is easily carried in a suit case if you are going to camp out.

A glance at the book will suggest many useful articles that may be made.

When questions arise you may write to us and we will answer them.

We can furnish you with all the materials you will want to use.

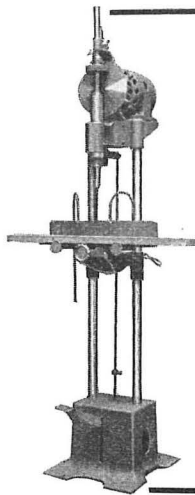
The Book \$5.00. The Outfit \$15.00. If you order this book and outfit, beginning July 1st you may write as often as you please for eight weeks and we will answer your questions for \$5.00.

The Summer Course complete \$25.00.

Write for Circular.

METAL CRAFTS PUBLISHING COMPANY

PROVIDENCE, R. I.



ENTHUSIASTIC LETTERS

are coming in from users of these Electric Mortisers and Boring Machines. Quick, Accurate, Easy to operate and Inexpensive—these are the good reasons for the success of the

Superior Electric Mortisers and Multiple Speed Boring Machines.

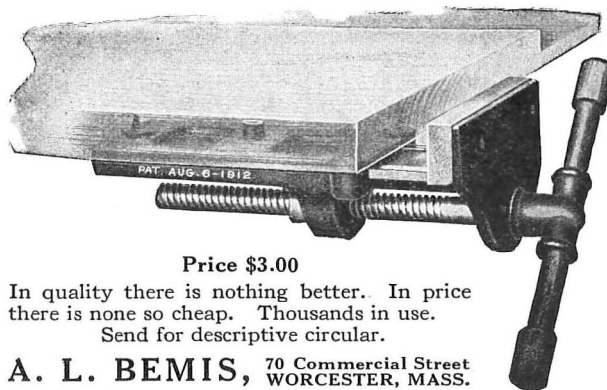
Made in three styles for both Motor and Belt Drive. Write today for

FREE TRIAL

WARREN W. MORSE

1308 West Lake St., MINNEAPOLIS, MINN.

THE BEMIS STANDARD VISE



Price \$3.00

In quality there is nothing better. In price there is none so cheap. Thousands in use. Send for descriptive circular.

A. L. BEMIS, 70 Commercial Street
WORCESTER, MASS.

IN NEW LOCATION.

Shop teachers who have been troubled by the breakdown of electrically driven tools, particularly portable electric drills and grinders, have appreciated the type of prompt repair service furnished by the Electric Tool Repair and Maintenance Company, Chicago. The firm has recently removed to 23-27 South Jefferson Street, where it has opened a large shop for quick service. The firm buys and sells second-hand electric tools and is prepared to give especial attention to schools.

SETTING CUTTER HEADS.

J. D. Wallace and Company have just published a handy tag containing full directions for setting knives in circular cutter

CUSHIONS = SPRINGS UPHOLSTERING SUPPLIES FURNITURE HARDWARE

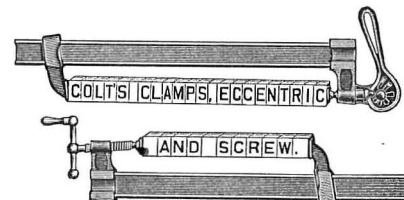
We issue a Booklet containing valuable information for Instructors in Manual Arts.

It's Free — Write for it.

The Kunkle Furniture Mfg. Co.

Fourth Street

MACKINAW, ILL.



Forty styles of Quick Acting Clamps for the Worker in Wood, Cement and in the trades generally.

Your dealer will supply you.

Ask for catalog No. 278.

BATAVIA CLAMP CO.

219 Center Street

BATAVIA, N. Y.

heads. While the tag is intended to be used in connection with the well known Wallace Bench Planer, it applies to any standard make of circular cutter head and will be found especially valuable by teachers of woodworking who give their students a practical working knowledge of the care of woodworking machinery.

Copies of the tag will be sent gratis in quantities to any teacher who will address J. D. Wallace and Company, 1401 West Jackson Blvd., Chicago, Ill.

PERSONAL NEWS.

Edward S. Kempton, chief instructor at the Harris Manual Training School, Woonsocket, R. I., has been given a two months' leave of absence to take charge of the training of ship-builders at Newport News, Va.

Walter Lumby, instructor in machine shop practice at Stivers Manual Training High School, Dayton, O., died at his home on April 16th. Mr. Lumby was 48 years old.

Mr. C. Edward Newell, supervisor of art in the public schools of Springfield, Mass., is chairman of the Eastern Section in the War Savings Poster Competition which the government has begun in the schools. Mr. Newell's territory covers New England, New York, New Jersey, Delaware, Pennsylvania, Maryland, and the District of Columbia.

Miss Katherine Gould, of Bloomington, Ill., has become instructor in domestic science at Pekin, succeeding Miss Bertha Kraeger.

Mr. Harry C. Rude, manual training instructor at Grand Forks, N. D., has resigned.

Aaron Altmann has been elected director of drawing and art in the high schools of San Francisco.

Mr. L. R. Fuller, graduate student of the University of Missouri, has been selected head of the manual training department at the Southwest Texas State Normal School, San Marcos, Tex.

Myron Edwards, who taught manual training at Amarillo, Tex., has resigned to enter the army.

Mr. Walter H. Miller, who has for the past three years been teaching manual training and mechanical drawing in the public schools of Huntington, W. Va., has resigned his position to join the air service of the United States. His place has been filled by Mr. Childs, an instructor of manual training at Marshall College.



A VALUABLE PROCESS EXHIBIT.

The seven main steps in the manufacture of hammers are shown in an exhibit just prepared for schools by the Vaughan & Bushnell Mfg. Co., Chicago. The exhibit is mounted on a heavy wood panel and is accompanied with complete descriptive material which teachers may use in explaining the processes of hammer making. The Vaughan & Bushnell Mfg. Co., will be pleased to send interested teachers the conditions under which the chart is issued to schools.

PERSONAL NEWS NOTES.

The Home Economics Teachers of Arkansas, meeting in joint session with the State Teachers' Association on April 5th, elected the following officers: President, Miss Myrtle Wilson, Little Rock; secretary, Mrs. Marion W. Cale. The manual training teachers elected John C. Anderson president, and A. J. Smith secretary.

Prof. R. H. Danforth, head of the hydraulics department of the Case School of Applied Science, Cleveland, has been appointed head of the government school of naval design which has been established at Case. A six weeks' course is offered in the school to engineering college graduates, at the end of which they may be placed on the emergency fleet list for work in ship-building plants.

F. L. McAleavey has been appointed director of the continuation school at Fond du Lac, Wis.

Miss Margaret Wilson has been elected temporary president of the Southern Industrial Educational Association. The association is devoted to the furtherance of moonlight schools and vocational education among the young people of the Virginia and Kentucky mountains.

John Callahan, of Menasha, Wis., has been elected Director of Vocational Education for Wisconsin. Mr. Callahan succeeds Frank Glynn, who has accepted a position in the United States Aeroplane Works at Buffalo.

Ernest E. Davis, of New Paris, O., has been elected instructor in manual training at Warren.

Miss Annie M. Eaton, a teacher of domestic science in the Boston schools for a number of years, died April 11th at Cambridge, at the age of 42.

Miss Elsie E. Atkins, of Minneapolis, has gone to Chicago where she has become connected with the sub-committee on children in industry of the woman's committee of the Illinois Council of National Defense. The committee has been created as a war measure and seeks to prevent the employment of young children in industries which before the war employed older boys.

Miss Mollie Feil, of Nampa, Ida., has resigned to become a worker on the food board of the government. Miss Feil will make her headquarters at Charles City.

A. F. Payne has been re-elected vocational director and associate superintendent of schools at Johnstown, Pa., with a salary of \$3,500 a year.

G. C. Ranne and C. K. Standish, instructors at the Waukegan Township High School, Waukegan, Ill., have resigned to enter Y. M. C. A. work in France.

Harry M. Garvey of Muskegon, Mich., who resigned to enter the army, has been commissioned second lieutenant in the artillery and expects to leave for France.

J. A. Pratt, formerly of the Williamson Trade School of Philadelphia, has been appointed director and superintendent of the Delgado Central Trades School for Boys about to be erected in New Orleans. Mr. Pratt will receive a salary of about \$5,000 per year. He will supervise the plans for the new school which is to be erected on a site adjoining the famous City Park, New Orleans, in which the historic dueling grounds of other days were a part.

The city of New Orleans has on deposit a legacy of about \$1,000,000 left by Isaac Delgado for a trades school for boys. The school will be built on the unit plan and the first structures will cost about \$270,000. Mr. Pratt has suggested that other units be built after the school is established so that pupils can have the benefit of actual construction in erecting the successive units as they are required.

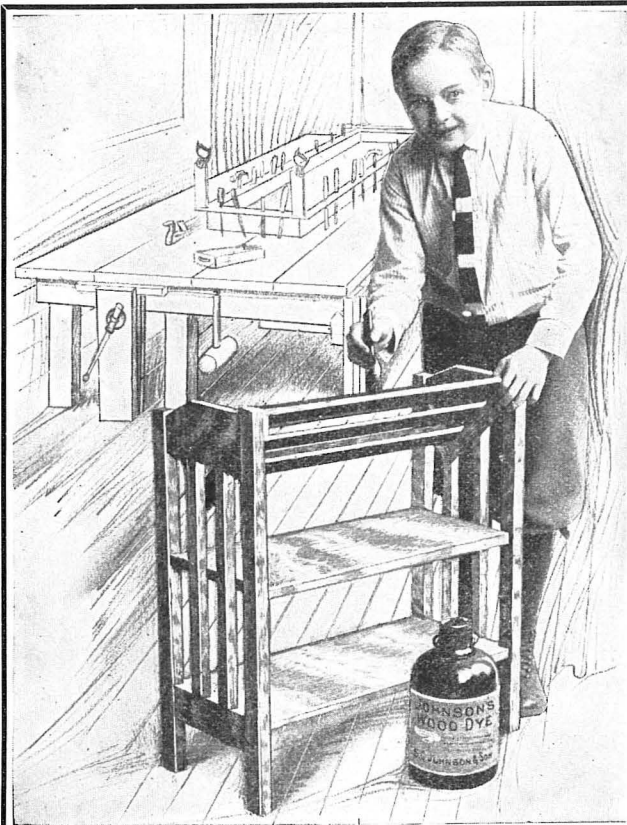
The school will be administered by a board of administrators to be appointed by the City Council. While the school board of New Orleans is co-operating, the school will not be under the direction of the school board.

Mr. Pratt will be guided considerably by the exhaustive survey for the school made several years ago by Dr. David Spence Hill.

Miss Cleo Murtland has become principal of the Philadelphia Girls' School of Trades.

Mr. Chas. R. Bostwick, principal of the Kamehameha School for Boys, Honolulu, Hawaii, will return to the States in June, having completed three years' service. For nine years he was supervisor of practical arts in Plainfield, N. J., and previous to that was instructor in the Brockport, N. Y., State Normal School. He intends taking post-graduate work at an Eastern university.

Mr. Weston W. Mitchell, manual training instructor of Minneapolis, Minn., has been appointed chairman of the manual training branch of the Northern Red Cross District.



Every Amateur Craftsman

has experienced the disappointment of having a beautiful piece of furniture—one on which he has spent many hours—spoiled with improper finishing. Johnson's Wood Dye and Prepared Wax are especially adapted for furniture work—they are being used in many of the finest furniture factories in the country. The most inexperienced can use Johnson's Wood Dye and Prepared Wax successfully.

Johnson's Wood Dye

is the best stain to use for coloring the wood. It goes on easily, without a lap or a streak—penetrates the wood without raising the grain—is made in 14 standard shades. Johnson's Wood Dye is unequalled for staining reed and wicker baskets.

Johnson's Prepared Wax

is the proper finish to use over the Dye. It imparts a hard, velvety finish of great beauty and durability. It is impervious to water, dust, scratches, finger prints, etc. The finish obtained is sanitary, durable and beautiful.

Send this coupon for the new Instruction Book telling how to finish new work and refinish old work.

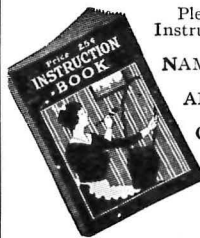
Please send me free and postpaid a copy of your new
Instruction Book on wood finishing.

NAME.....

ADDRESS.....

CITY & STATE.....

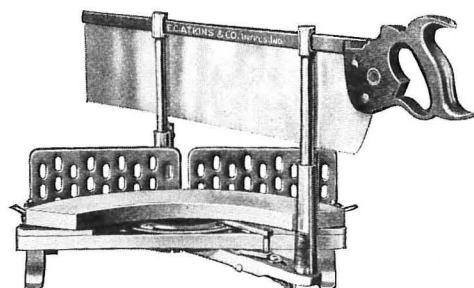
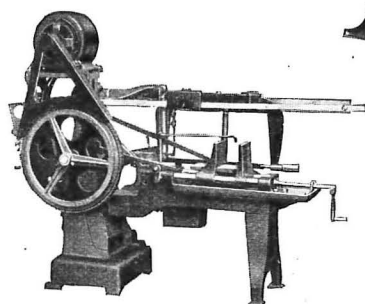
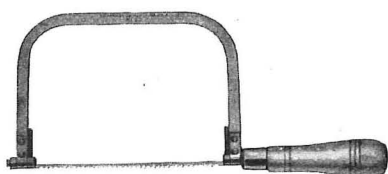
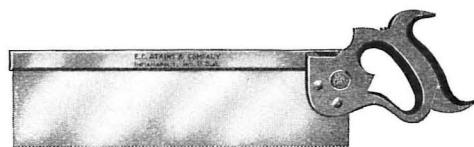
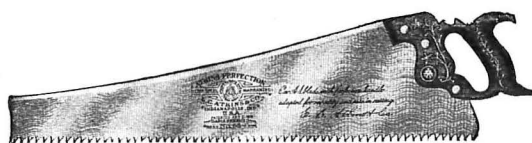
Fill out this coupon and mail to
S. C. JOHNSON & SON
"The Wood Finishing Authorities"
RACINE, WIS





ATKINS

Silver-Steel SAWS and TOOLS



We manufacture a large line of the best SILVER-STEEL SAWS and Tools for the highest class of educational work in Manual Arts. They are the choice of the finest mechanics and for this reason are logical tools for the instruction of beginners.

Catalog and Instructors' Assistance

Our 60-page Manual Training Catalog explains the advantages of SILVER-STEEL SAWS and Tools. Write for it at once using the coupon. In this way you also get our complete plans for assisting instructors.

E. C. ATKINS & CO.

Incorporated

Indianapolis, Indiana

E. C. ATKINS & CO., Inc.

Indianapolis, Indiana

Gentlemen: Kindly send your Manual Training Catalog and Instructors' Plans to me without further obligation.

Name _____

Address _____

I. A. M.